

THE IRON AGE

DUCTION -- MANAGEMENT

NOVEMBER 16, 1933

PROCESSES -- NEWS

ALL of the Cards on the Table ♦ ♦ ♦

The wise player insists that *all* of the cards be laid on the table, not merely the aces and kings.

For it is *average* strength and not the occasional lucky ace that determines the winning hand and the winning player of the game.

The wise buyer of advertising should likewise insist on a complete disclosure of facts when accepting evidence of reader preference.

A mixture of strength and weakness is more convincing of an independent and square deal than is the exclusive display of survey aces.

In the 39 separate and independently conducted investigations by

industrial advertisers in which The Iron Age and other publications were rated as to sales influence through determination of reader preference, The Iron Age was beaten by other publications 12 times. It won first place 27 times.

Putting it another way, among the 9500 buyers of industrial equipment, materials and machinery who thus expressed reading preferences, The Iron Age polled 6566 reader votes. This far exceeded the polled vote of any other publication.

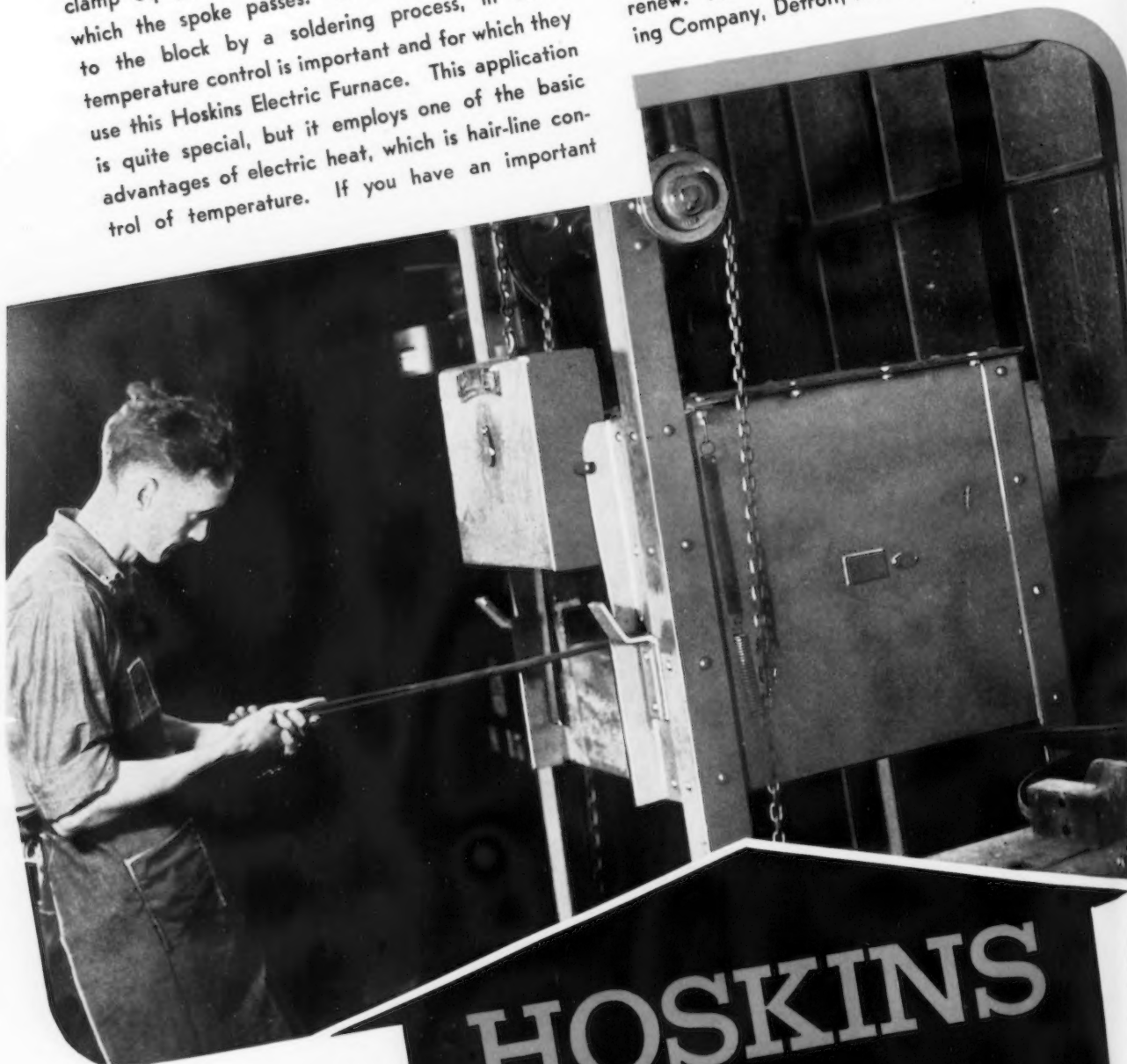
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One reason is, that the spokes are welded right. In the welding operation, the spoke is held in a clamp equipped with a special alloy insert thru which the spoke passes. This insert is attached to the block by a soldering process, in which temperature control is important and for which they use this Hoskins Electric Furnace. This application is quite special, but it employs one of the basic advantages of electric heat, which is hair-line control of temperature. If you have an important

heating operation, within 2000° F., it will pay you to investigate Hoskins Furnaces in which you have uniformity and control of temperature that cannot be had with fuel, and thru which you get good results that you are sure of, day after day. The Chromel elements last a long time and are easy to renew. Ask for Catalog-531. Hoskins Manufacturing Company, Detroit, Michigan.



The Wire that Made
Electrical Heat Possible

HOSKINS Electric FURNACES

△△ THE IRON AGE △△ November 16, 1933 △△

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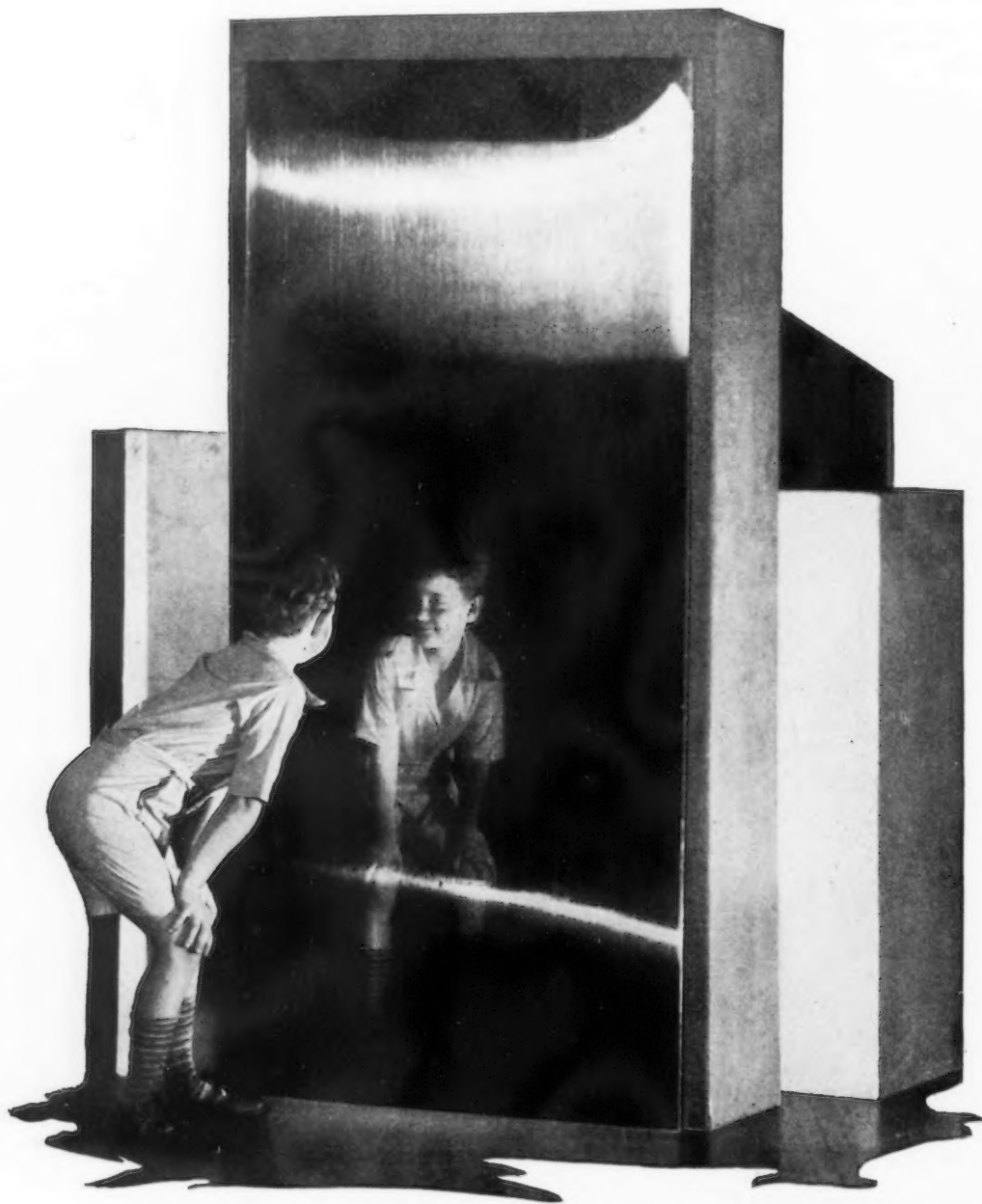
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Young Peter Seems Pleased

YOUNG Peter Van Dyke seems pleased with this sheet of polished Allegheny Metal (18.8 stainless steel). But the sheet will have to pass his old man before it is accepted for Ryerson stock—

And Van Dyke, Manager of the Special Steels Division, is difficult to please. No matter how flat, how smooth, and highly polished, he always wants them better—and usually gets what he wants.

And so it is with all other steel products. They must pass rigid Ryerson inspection before being accepted for Ryerson customers.

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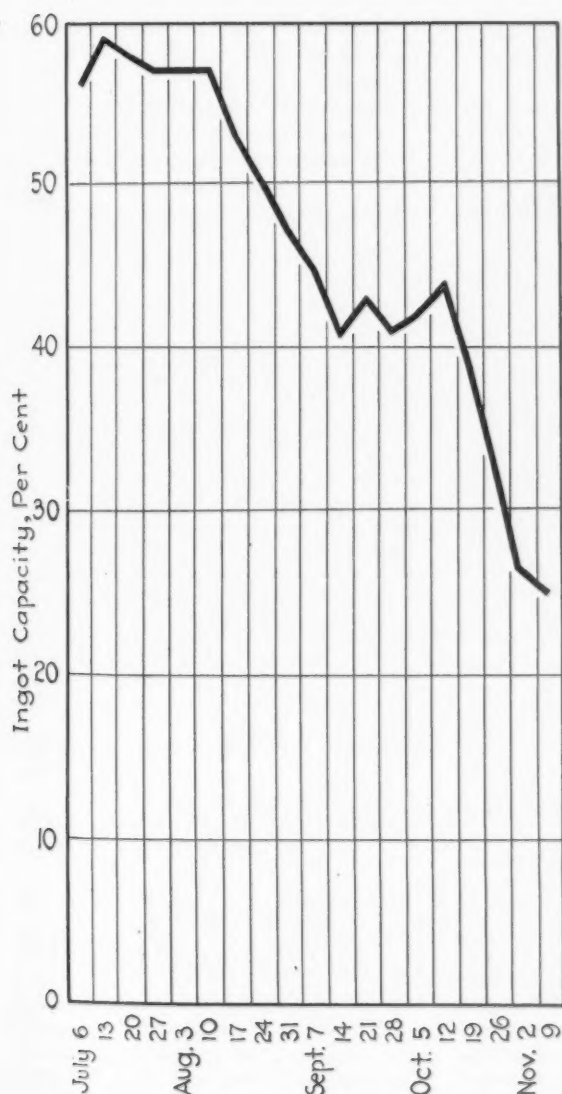
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ESTABLISHED 1855

NOVEMBER 16, 1933

Vol. 132, No. 20

A Real Hobgoblin for General Johnson



Weekly Steel Operating Rate Since July 1

OUR forceful Recovery Administrator has expressed his opinion of those who are setting up "imaginary hobgoblins" which reflect adversely upon NRA.

On this page, we present a real hobgoblin. It is the curve of weekly steel operations since July 1.

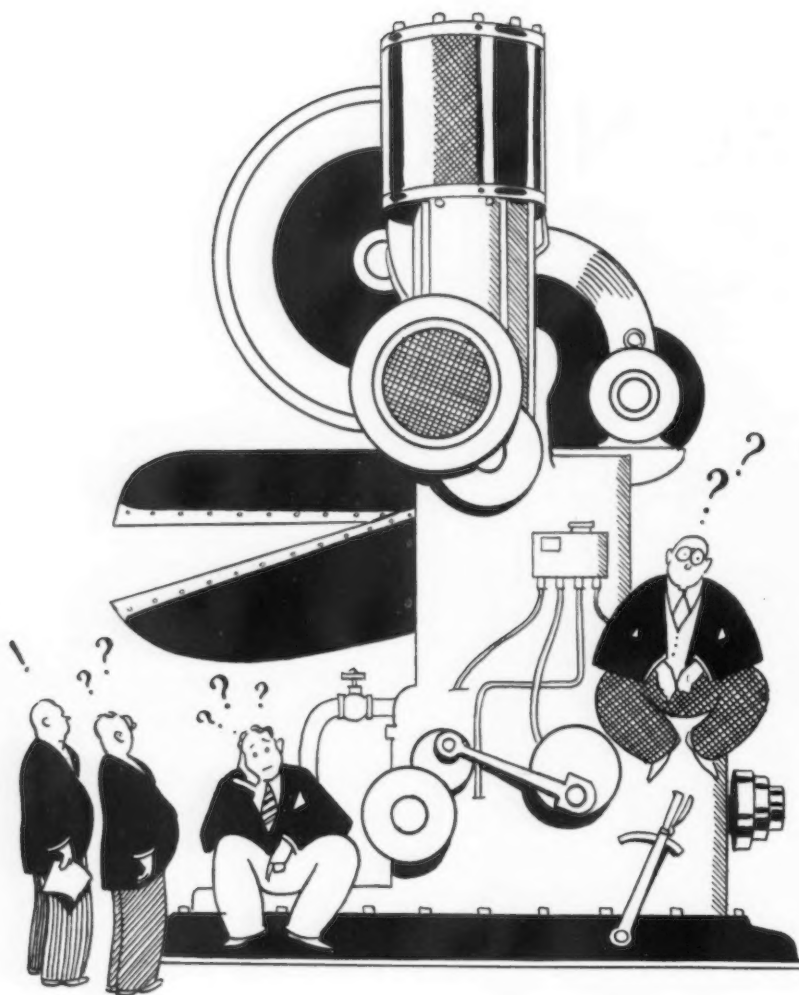
This factual hobgoblin gives food for thought. The underlying theory of NRA is that increased wages and shorter hours will be offset by greatly stimulated volume of business. Steel volume has been more than cut in half during the past four months.

STEEL is an accurate reflector of the capital goods industries, because steel is the chief basic material of these industries. As steel goes, so go our capital goods.

Capital goods are financed very largely by private investments. They are not bought with income as are food, wages, housing.

The flow of private capital into capital goods investment shrinks when public confidence falters. And confidence is not fostered by bureaucracy, threats of labor union domination or socialistic experimentation.

THE steel hobgoblin is a real one. It cannot be dismissed by ridicule or abuse. Restoration of confidence of private capital is the one way to get rid of it.



It is generally recognized that our present standard of living was only attained by virtue of widespread technical progress. We know that we must continue that progress. Yet, in spite of that, there is now a strong current of opposition to the introduction of further labor-saving devices of any kind, whether they be new machines, new methods, or merely the abolition of useless practices. This opposition is nothing new, but is always most pronounced at a time when remunerative jobs are scarce. It is then that the machine is labelled and libelled as a devilish device for pushing more men into the ranks of the unemployed.

So at a time like this, it is highly essential that the social effect of the machine be clearly understood, and especially its effect on employment. When a management introduces new machinery, it should fortify its position by having a definite policy to gain the willing cooperation of workers. Far too many concerns simply forced acceptance of the machine as a necessary evil; it is these who are now shirking the whole problem—"waiting for things to quiet down"—rather than contributing to solving our problems. In the face of the present aggressive mood of labor, such defensive

strategy is a delusion, for it is neither defensive nor strategy.

The German philosopher Spengler may be right in regarding man as the highest development of the predatory species, but his logical prey is the planet, not his fellow-man. The task for management is to see that the machine is used as an instrument to extract an ever-increasing yield from nature to the benefit of all our workers, whether they wear white shirts or black—and equally important, make these benefits plainly apparent to all. We shall see presently that there are circumstances under which antagonism to the machine is justified. Such causes need to be exposed and avoided. I shall therefore here attempt to summarize an analysis of the impact of the machine and suggest a formula which may be used as a basis of policy.

It is axiomatic that a labor-saving device, being one which saves more labor in operation than is consumed in building it, releases human effort and so adds to the potential wealth of all. But whether we realize on this potential wealth depends entirely on what we do with the released labor. As long as human wants remain unsatisfied, we cannot side-step the issue by shortening working hours. Any

If industry is to achieve self-control, it must act as an impartial arbitrator in the conflict between men and mechanization. And to act intelligently in this capacity, it must formulate a sound policy regarding the treatment of technological gains.

In this article, Mr. Losely presents a thoughtful and constructive study of the five avenues open to the distribution of profits from mechanization. He suggests 40 per cent to ownership for writing off cost of new equipment, 30 per cent to the general wage fund and a 30 per cent reserve to minimize impact of rising prices of purchases. He also advocates use of a licensing plan to enable industry to control its obsolescence rate.

attempt to legislate unduly short factory hours will simply stimulate home industry.

What to Do with Profits From the Machine?

So the whole problem centers around the dual question of the profits from the machine. Who is to get them and what is to be done with them? There are essentially five different courses which may be taken:

1. We may pay the same wage rate for labor, but using less per unit output, sell the product at a lower price.
2. We may maintain the selling price, but increase wages, dividends and bonuses.
3. We may use the additional margin to further expand and improve the plant.
4. Governmental authorities may impose greater taxes.
5. We may hoard the profits, either in cash or inventories.

We should be able to gain much light on the workings of the machine by tracing through the consequences of each of these courses in turn.

The first course, reducing prices, if it could be rigidly adhered to, would result in a general rise of real wages,

ing Technological Gains

By H. P. LOSELY

to Reconcile Man to Machine

and with that, an immediate dispersion of the benefits of improved technology. The increased purchasing power given to the consumer would stimulate demand, not merely for those goods which are lowered in price, but by expansion of the budget range, permit purchase of goods hitherto out of reach. So any unemployment caused would be quickly cured by new work provided elsewhere. Unfortunately, this method of dealing with profits has another effect on the condition of business, which frequently comes into play before reemployment relieves the stress. If profits are directly passed on to the consumer, we are confronted with the condition of a descending price level, notoriously discouraging to enterprise. Damaging is really a closer description when the conflict of competition is directed into price wars. For as soon as price concessions are forcibly exacted from the plant owner, he in turn demands that his workers pass back to him their savings from reduced living costs by working for lower wages.

We thus engender a warfare of commercial attrition, in which the less efficient producers not only cut wages, but also sacrifice their own resources. Selling at prices less than true costs, their income from sales, even at full capacity, does not provide enough to replace the machinery. So the stage is set for the sheriff. If the process involved nothing more than the sacrifice of obsolete machinery, the social consequences would not be so utterly disastrous. But just as in military warfare, the non-combatants are drawn in and in the shifting of forces, there is a wholesale destruction of intangible values and vast losses of national wealth and income are incurred. The moral for the individual organization is of course to keep up with the continuous march of progress and avoid being caught with obsolete equipment. But it is almost equally important to avoid precipitating warfare by passing on processing gains in the form of disturbing price reductions.

Increasing Individual Income

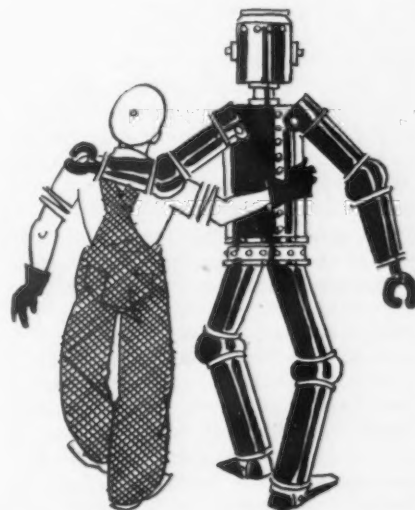
The second course, of increasing wages, dividends and foremen and management bonuses, is the ideal method of disposing of technological profits. When spent rapidly enough—

and they are often spent before they are earned, via the credit route—they not only avoid causing unemployment, but may even create labor shortages. The steel industry has not lacked leaders who used high remuneration to build up strong organizations and hold them to top-notch performance. It is, however, not commercially feasible to use all the gains in this way. Especially in a competitive field, successful technique is soon copied; even patents and secret processes do not afford lasting security. So to retain a leading position, some of the profits must be devoted to experimentation and search for further improvements.

If the third course of using released labor for making still more machinery and expanding plant capacity is pursued to the exclusion of everything else, the gain is never realized. Profits continuously ploughed back into plant improvement have furthermore the unfortunate effect of building up excessive employment in the manufacture of capital-goods at the expense of developing the more stable consumer-goods industries. The effect of technological progress is thereby sterilized. Then in a period of business contraction we pay the national penalty for having built up too elaborate a plant without providing for consumption. It is not that all the plant is too elaborate; the most injurious result of the fierce competition for superior equipment is that obsolescence is forced up to an excessive rate and consequently wealth is rapidly destroyed. This factor is exceedingly important. There is much evidence to indicate that, during the eight years preceding the crash, the major portion of our increment in productive power was absorbed in this barren effort to build super-efficient plants. Then we apparently had a simultaneous realization that a good thing had been overdone and new investment in capital-goods nearly ceased, throwing out of work our most highly paid men. Not only that, but in an effort to keep the best equipment fully occupied, the profits no longer used for improvement were diverted to price reductions and so destroyed the commercial value of much inferior but still serviceable equipment. This explains much of the disorganization of our producing system.

Much has been said about the in-

equality of distribution of wealth and of income as a cause of national troubles. One of our leading economists predicts that we must expect greater taxation in the future as a means of wider social dispersion of the gains from mass production. That may be a perfectly sound proposition in distribution economies, but it raises many questions of human management. If we release labor in private production only to have it commandeered by government, we have no assurance that it will be put to beneficial use. It may even be used for extremely destructive purposes. Military warfare is not by any means the only one; government may embark on all kinds of undertakings which indirectly compete with private enterprise and by reducing the volume available to the latter, destroy capital values. Canals, housing, free departmental services and many other instances are now being brought into the limelight. If private industry is still to continue it will presently need a code of fair competition from our various governmental authorities. In a different class are the expenses of self-government of industry, the self-imposed charges through trade associations for their own policing and promotion of collective research and development work. Being under control of those who best understand the needs, they are more likely to be restrained before they reach the point of vanishing returns. Certainly, the leaders who are trying to develop better self-government in



their own industries need the thoughtful help of all their members if we are to avoid further political encroachment.

The fifth course of dealing with profits, piling up liquid resources, is the most dangerous of all. As its consequences are less commonly understood and have a critical bearing on our economy, we need to examine it in some detail. There is of course a need for a certain amount of stored wealth. The cotton carry-over between crops, pig iron in the yard of the merchant furnace, finished stock ready to ship from warehouses are all necessary shock-absorbers. The danger comes when such stocks are piled up in excess of normal needs and ultimately come into competition with current production and necessarily slow down the latter till balance is restored. In other words, by delaying an effective distribution of the profits, we set the stage for a later contraction of business. It is then that especial care is necessary in the application of labor-saving devices, for if they are used to pile up liquid resources, the men displaced will be forced into fields of diminishing return.

Forced Into Gold Mining

Under these conditions we see resort to subsistence farming, and uneconomic expansion of sales efforts with ever less return. The ultimate effect of this procedure is most clearly evident when the exaggerated demand for liquidity and cash diverts more than the normal quota of producers to the mining of our exchange medium, gold. The established mines cannot readily increase output, so the men who seek to produce wealth by mining gold have to work in areas which are commercially unprofitable. And the more men are pushed into such occupation, the poorer the field they will find, and the less wealth per day they will be able to produce. It is when the machine is thus used to push men into fields of diminishing return, without opening new fields of increasing return at the same time, that it arouses antagonism.

It should now be clear that the machine is not by any means a neutral factor in the business cycle. It may be either a beneficent force or an agent of destruction. So the need for a definite constructive policy should be equally evident. Can we devise a basic formula which, if followed, will ensure beneficent results?

We must immediately rule out any use of the machine for accumulating liquid resources or "hoarding" profits. Tax rates are generally beyond individual control, but we have recently seen in New York some interesting results of concerted action against mulcting impositions. One may also recall the frequent use of bonuses distributed after the war to avoid paying excess profits taxes. Even today, the alert manager is not totally help-

less; he is in a strong position to bargain with his local assessor, and by judicious disposal of surplus equipment, he can write off sufficient to compensate for inadequate government depreciation allowances. Our principal choice, however, lies between the three major courses: Are we to pass on cost reductions in the form of price reductions, shall we increase wages, or should we spend the profits in a grand effort to build an ultra-modern show-place?

A Formula for Distributing Gains

The objection to price reduction has already been stated. Yet there is one obstacle to total abstinence from using it: it may be the only way a new machine or process can prove its superiority and displace the old one, unless quality instead of price can be used as the leverage. The use of gains to increase wages is desirable as far as may be practically possible. Sinking profits entirely into machinery is a snare and a delusion. As a practical balancing of forces, the following division of the gross profits from a new machine is basically sound practice under present conditions: Allot 40 per cent to ownership for writing off the cost, for further development work and for incentives to management. Allot 30 per cent to the general labor fund of the concern to increase wages for all. Out of the remaining 30 per cent, absorb as much as possible of any increased cost of supplies, so as to minimize the impact of rising prices, but if any part of this use is not necessary, divide it between dividends and wages. This scale is of course an approximate one, subject to individual judgment. The reasoning on which it is based may be briefly indicated:

Examination of the manufactures census figures indicates that industry as a whole tried for several years to distribute the technological increment

on a scale of about 80:15:5, instead of the suggested 40:30:30, and the result was profitless prosperity. If the "plough-back" rate is restricted to 40 per cent and the first 10 per cent set aside for purposes of management and absorbing losses on experimental equipment, it will leave 30 per cent of the gross for obsolescence; that would demand an active use of equipment for 3 years, and about 1 more year as reserve, and that should be practically fast enough to change over major machinery.

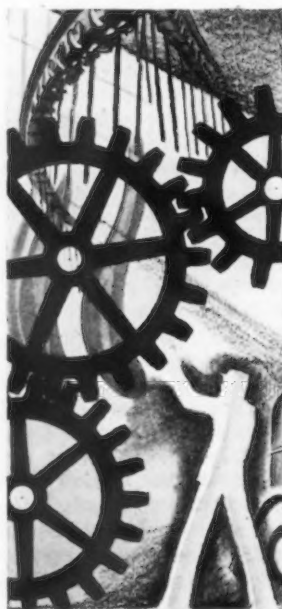
On the theory (admittedly debatable) that the reward to labor should be increased at the same rate as technological efficiency and on the further assumption that 50 per cent of conversion costs are for labor (since that usually yields the best net economy) 50 per cent of the net profit profit should go to the labor account. Hence the 30 per cent (50 per cent of 60 per cent) of the gross. This is also in accord with experience with wage incentives. Although Taylor years ago used very high rates to stimulate sustained efforts, the general tendency was to use not more than 20 to 25 per cent bonus as normal recompense for first-class performance. One objection to really high bonuses was that the worker accumulated more than he could readily spend without playing truant. Under present conditions, with shorter work-hours and generally low base rates, we may need to revise our figuring; the question of what bonus over common going rates will produce optimum results is again a fertile field for research.

The suggested disposition of any balance should be self-explanatory. Under present conditions, new machinery should not be used to reduce prices; if any extra consumer inducement is necessary, any margin would better be used on product improvement. It is again emphasized that it certainly should not be used to accumulate cash or even liquid resources beyond prudent needs.

Advocates Use of Licensing

Now to be able to practically operate on any such budget plan it is evidently necessary that industry obtain control over the obsolescence rate of its machinery. Up to now, competitive manufacturing has not had any such control, but has all too frequently been compelled to take huge losses when the sudden introduction of a new machine has made existing ones obsolete. Hence neither its stability nor its planning have approached the standards reached in monopolistic business, such as the telephone companies. Therein lies a major obstacle to the expansion of credit. Those who are lending millions in Wall St. at $\frac{1}{4}$ to $\frac{3}{4}$ per cent on short term would be only too pleased to loan it for a longer period at higher rates if they had assurance of security.

(Concluded on Page 56)





Zinc For Steel Protection

By HERBERT R. SIMONDS

METALLURGISTS in general agree that pure zinc is one of the best corrosion protective materials for steel. The problem is to secure a thin, impervious, uniform coating of pure metal and much research work and discussion have centered around this seemingly simple task. In regard to zinc coatings on many steel products, investigators are divided into two schools, one advocating electro-galvanizing and the other hot-dip galvanizing. In England recently the relative advantages of these two methods of galvanizing was the subject of an important debate between leading manufacturers, but nothing was definitely solved, for the problem, although sounding simple, involves so many variables that the answer does not depend alone upon the method selected but upon many other factors such as mechanical and chemical details.

In the case of wire, mechanical operations subsequent to galvanizing may cause a non-uniform coating which will throw criticism back on the method of galvanizing. The consensus of opinion among English metallurgical engineers seems to be that the hot-dip process may lend itself better to the galvanizing of sheets, and the electro-galvanizing method may be best for wire. In this country electro-galvanizing of steel wire is still pretty much in the experimental stage. The Bethlehem Steel Co. is producing some electro-galvanized wire and is experimenting with new methods. The General Electric Co., John A. Roebling Sons Co., and others are electro-galvanizing flat wire in the manufacture of BX protective wires for the electrical industry.

But other than these examples there seems to be no one regularly producing electro-galvanized steel wire. In contrast to this, the production of electro-galvanized wire in Europe is on a well standardized basis with more than 50 plants in operation. Some of the European manufacturers claim that a thin coating of zinc put on by the electro-galvanizing process will withstand corrosion better than the much thicker coating put on by the hot-dip process.

▲ ▲ ▲

MANY of the recent questions received in The Iron Age question and answer department have been concerned with galvanizing in one form or another. Is electro-galvanized steel wire available in the United States? Is hot-dip better than electro-galvanizing for sheets? How thick a coating of zinc should be used for the best protection of guy cables? What paint is best for use on galvanized structural shapes? These are typical of the questions received. Some questions are answered in the accompanying article, and others will be answered in similar future articles.

Hereafter, the policy in the question and answer department will be to group questions as far as possible and answer them in a sort of symposium, of which this article is the first.

▼ ▼ ▼

In answer to a question about electro-galvanizing of wire, submitted to the Langbein-Pfanhauser-Werke in Leipzig, the following comment was received:

"We have placed in operation many plants for electro-galvanizing of wire, some of them for the simultaneous galvanizing of as many as 52 wires and with this experience back of us we firmly believe that the electro-galvanizing process is the only one which will yield a pure zinc coat. In hot galvanizing, even if a bath of electrically refined zinc is used, the bath will soon become contaminated with iron which is readily dissolved by the molten zinc. It has always been a problem in hot galvanizing to keep the formation of zinc iron alloy to a minimum. Electro-galvanized wire can be distinguished from hot galvanized wire by immersion in a 5 to 10 per cent sulphuric acid solution. The former will outlast the other three to four times.

"If the electro-galvanizing process is properly carried out, a homogeneous and uniformly thick deposit of pure zinc is produced, intimately bonded with the base and having a smooth and shiny surface which will neither peel nor crack.

In fact it would be justified to claim that electro-galvanized wire need not have as thick a coating as hot galvanized wire to give the equivalent service.

"In addition, the electrolytic method does not affect the physical properties of the steel base and therefore recommends itself for the higher carbon grades of wire subjected to special heat treatments.

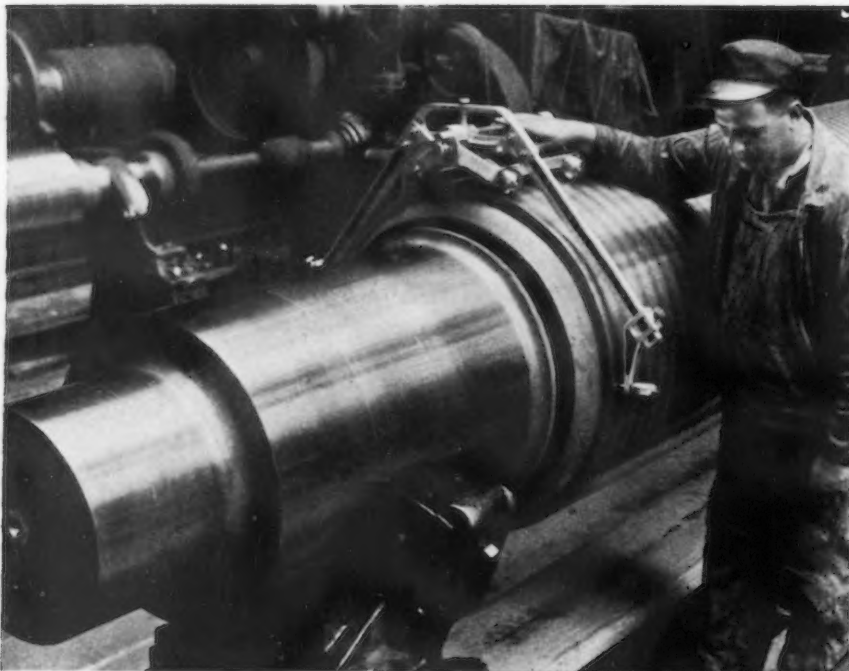
"Because of the smoothness of its surface, electro-galvanized wire can be worked more easily into barbed wire, cloth, braids, cables, etc. The uniform thickness of the deposit and great resistance to corrosion make it suitable for outdoor uses such as telephone wires and guy cables.

"As to the cost of producing electro-galvanized wire, it compares favorably with that of hot galvanized. In general, for thin coats it is lower and only for very thick coats will it be higher than for hot galvanized wire of the same thickness of deposit. For outdoor service, experience indicates that a coat of from 2 to 2.4 oz. per sq. yd. will give satisfactory corrosive protection for many years, as indicated by the Swedish Telephone service. In some of the plants we furnished, electro-galvanized wire is produced with zinc coatings weighing 7.2 oz. per sq. yd. to meet certain specifications. Such wires have a much longer life than double dip hot galvanized wire."

Problem of Safeguarding Interior Strands

The difficulty of safeguarding interior strands of steel cables against corrosion has been recognized for a long time. Tests have shown that corrosion in the interior of cables such as elevator cables and power transmission cables may impair the strength to as much as 20 per cent in three years. In one case the reduction was 29 per cent in seven years. The problem is serious because of the difficulty in determining the extent of corrosion on the inside of the cable, from the outside. Several investigators are now engaged in exhaustive study of this phase by means of the X-Ray. Cable manufacturers in order to prevent internal corrosion often use a lubricated core, but this lubricant naturally dissipates in time and it is almost impossible to replace it by outside application. Also, this emphasizes the importance of using corrosion-

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A special type of roll caliper is used for checking dimensions during grinding.

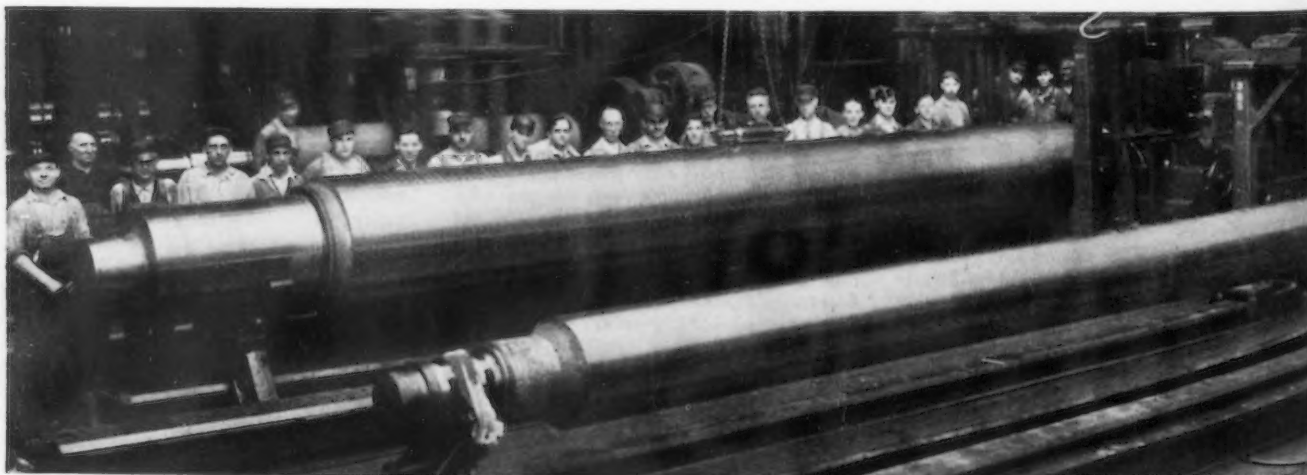
RECENT developments in the paper, the rubber and the cellulose industries have placed with the manufacturers of large chilled iron rolls startling demands for extreme accuracy of finish. The need for a precision finish of an unusual nature may be understood from the fact that certain types of paper are now being covered with ultra-thin colored coatings as an alternative to the former method of printing. The coatings are rolled on to the paper as part of the production process and must pass between close-set coating rolls before the actual contact with the paper is made. In the rubber industry an ultra-thin coating of rubber is being rolled on to silk, and in the cellulose field almost microscopically thin water-proof coat-

ings are being rolled on to many thin sheet products. These are just a few of many examples to show the trend in the manufacture of thin materials and to illustrate the challenge put up to roll manufacturers to produce an adequate precision product.

The rolls for producing the ultra-thin coatings are frequently 8½ ft. long and 2½ ft. in diameter, and the accuracy in roundness of some of the smaller rolls used for coating paper is 0.0001 in. The accuracy in parallelism demanded is such that two rolls running in contact with a strong light behind them will not show the slightest crack under close observation. The great need for accuracy in the finish of the rolls is not determined solely by the need for a uniform thickness of

stock, for in some of the coating processes on high speed work the whole drying operation is so carefully regulated that a spot with even slightly greater thickness will fail to dry and thus will cause wrinkles.

Such extreme accuracy as that described can be obtained on large units only when there is meticulous control of operations from the raw material through to the shipping department. One of the large companies which has been a leader in helping to solve the problem of securing thin coatings in the rubber and paper industries is the Farrel-Birmingham Company, Inc., of Ansonia, Conn. At the large roll manufacturing plant of this company, precision rolls are produced as part of the regular day-to-day operations.



The roll in the background is thought to be the largest paper machine calender roll ever made. It is 405 in. long overall and weighed 55 tons.

Extreme Acc

AN increased demand from several industries for extremely accurate rolls has taxed the ingenuity of chilled iron roll manufacturers. As so often happens, the solving of this problem has opened the way for extension in the use of large accurate rolls to many new fields. The accompanying article explains some of the methods used by the Farrel-Birmingham Co., Inc., to produce extremely accurate rolls. One recent product of this company, a calender roll 405 in. long, is thought to be the largest of its kind ever produced.

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Accuracy in Large Roll Finishing

Incoming material is checked in the company's own laboratories for both chemical and physical properties. In the company's foundry, cupolas, air furnaces and an electric furnace furnish molten iron of the proper temperature and composition for the casting of the large rolls. The molds for the rolls are built up in vertical position in deep pits set into the foundry floor and these are bottom poured through long, sandlined gates. A profusion of cranes and other devices facilitates the handling of material and makes it possible accurately to regulate the interval of time between the filling of the ladle at the furnace and the pouring of the castings on the floor. Such regulation is necessary for precision temperature control. Temperatures are checked before pouring, with an optical pyrometer.

Making the Roll Castings

The molds are built up with a series of massive cylindrical chills piled one upon the other and coated on the interior with a specially prepared compound, which serves as a parting coating and which also smooths over the joints between the different chill sections. The neck ends or journals of the rolls are molded in sand and are carefully baked at a closely specified temperature, and the procedure in connection with these parts follows customary gray iron practice, as it is not desired to have a chill on these surfaces.

After a casting has set and cooled sufficiently, the runners are broken off, the chills are removed and the roll is lifted out of the pit and placed on the foundry floor. Later the sand around the journals is broken away

By E. H. BERGES
Manager, Roll Department,
Farrel-Birmingham Co., Inc., Ansonia, Conn.

and the gates are chipped off by means of chisels and pneumatic hammers. At this point the rolls are ready to be transferred to the machine shop which is a spacious well-lighted building equipped with much special machinery.

Finishing the Rolls

The rough roll castings which enter this shop at one end are first centered in preparation for the turning of the necks, fillets and collars. The centering is done while the casting is revolved on idler wheels, so that the center points are located from the outside surface. The necking operation is performed in a lathe, with the roll revolving on its centers and at the same time the contour of the shoulders is completed. Where special fillets or collars are called for, specially shaped tools are necessary, but this is all work in softer metal and follows usual machine shop practice.

The roll then goes to the facing lathe to have the chilled body surface turned down. The facing operation is accomplished by long, flat tools held parallel to and moved up against the roll surface by means of screws. For this work the roll revolves very slowly, not more than six revolutions per minute. The cutting tools are normally high speed steel although tungsten carbide is used in some cases. On long rolls several cutting tools may be in operation at one time. Each

tool is about 8 in. long and its position is controlled by two screws, one at each end and each provided with a head which fits a special wrench. The lathes are set in pairs facing each other with an operator between to control the work on both lathes. The feeding of the tools inward toward a slowly revolving roll is an important operation and is one of the delicate parts of the roll manufacturing sequence. The amount of feed on the tools is governed by the feel of the operator's wrench on the regulating screws, and this calls for long experience and a knowledge of behavior of different irons under the cutting action. Because of the accurate contour of the rough casting, a minimum of machining is called for, and, of course, the less metal removed the greater will be the depth of chill on the finished roll. Usually the casting is about $\frac{1}{2}$ in. greater in diameter than the finished roll, which leaves about $\frac{7}{32}$ in. for turning and $\frac{1}{32}$ in. for grinding.

During the various stages of the facing operation the roll is carefully examined for pin holes. If pin holes appear they are marked with chalk by the operator. If the number of pin holes seems to be excessive an inspector is called who has the authority to accept or reject the casting. If a casting with some pin holes is accepted the facing is completed to bring the roll to the required diameter before grinding. The roll then goes to another section of the shop where each pin hole is drilled and plugged with a special material. These plugs are so carefully fitted that it is nearly impossible to find them after a roll is finished. After all pin holes have



This shows the method of turning journals, collars, and fillets on a 42-in. diameter linoleum roll.



An elaborate system of handling equipment is required in the roll foundry.

been plugged, the roll then returns to the regular production sequence and is now ready for grinding.

Special Machines for Grinding

The extreme accuracy required in the finishing of some large rolls has taxed the ingenuity of the company's engineers and it is only after much research that the demands of the rubber, paper, and metal industries have been met. The Farrel-Birmingham Company, Inc., for many years has built and operated precision roll grinding machines using two grinding wheels, one on each side of the work and both wheels mounted on a swing rest supported on knife edges on the carriage. Special gaging and caliper instruments have also been built to enable the operators to determine the accuracy as the finishing advances.

The general scheme of accurate roll grinding at the plant in its essential features follows customary practice in accurate grinding. The rolls are rough ground to within 0.002 in. of finished dimension and are then ground with a finer cut and with wheels of finer grain to about 0.0005 in. After this the roll is allowed to age to relieve any slight residual strains and to permit a stabilizing of the surface grain structure. The final precision grinding is merely an extremely delicate cut taken on a rugged machine using the principle of two suspended wheels, to the end that the action of gravity tends to minimize any tendency to error. Some special features of design are involved in grinding a stack of rolls where it is

necessary to compensate for the weight and the spring of the lower roll.

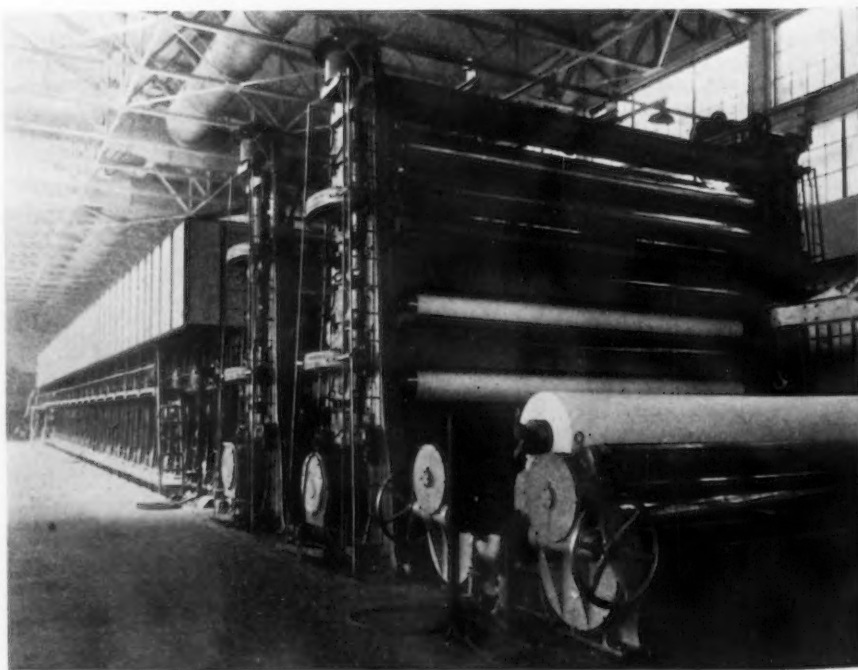
The new Farrel *Ni-Hard* rolls testing from 85 to 90 on the Shore scleroscope present some unique problems in production. These rolls are so hard on the face and journals that it is practically impossible to cut them with a tool so that it is necessary to

grind the entire roll, even the journals and fillets. This is done in a heavy duty one-wheel grinder of the company's own design and manufacture. This is capable of both heavy roughing cuts and the finest mirror finish and has been developed to meet the growing demands for speed and accuracy in the finishing of metal working rolls. These new rolls are now being used for the finishing of extremely fine metals and are considered to be well adapted for this type of work.

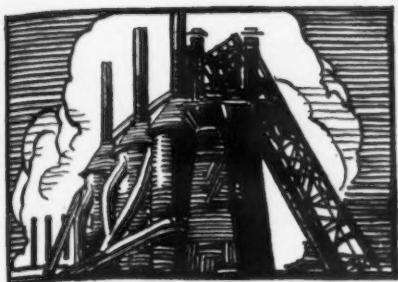
A Giant Calender Roll

What is thought to be the largest paper calender roll ever made was recently produced in the Farrel plant and its unusual size created several manufacturing problems which were successfully overcome. The roll, shown in an accompanying illustration, is 36 in. in diameter and has a face 298 in. in length. It is the bottom roll of an 8-roll stack and is 405 in. in total length. In the rough it had a weight of 55 tons. It was necessary to build an entirely new roll pit in the foundry, as the previous one had insufficient capacity to handle this length. The old pit was 24 ft. deep and the pit built for the large roll is 30 ft. deep. The construction of the pit itself involved some difficulty, as it extends below high water of an adjacent river and yet must be absolutely water-tight or serious trouble might develop. In addition to the usual type of waterproofing, it was necessary to supply an interior finish which would not be damaged by an accidental run-out of molten metal. Briefly, the completed pit consisted of an outer steel caisson inside of which was a concrete wall. Inside of the concrete was a layer of waterproofing

(Concluded on Page 51)



This shows a complete paper machine with large roll stacks as installed at a plant in South Carolina.



Lump Peat As a Fuel for Blast Furnaces

By B. M. SUSLOV
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IN distinction from U. S. A. the Soviet Union is a country which has large supplies of peat. According to the statistic data about 70 per cent of the world's area occupied by peat bogs are located in U. S. S. R. The possible area occupied by these peat bogs in this country is estimated at not less than 130 million hectares.

Up to the present time peat had been only used for firing steam boilers.

The peat problem became actual in the Soviet metallurgy during the last years owing to the development of the machine-building industry. The central districts of the Soviet Union such as: Leningrad, Moscow and Gorky form the main centers of the machine-building industry, where the high quality pig iron, which is needed for the building of machines, is obtained from distant places of the Soviet Union as: Ural district, Donetz coal mining district, located in the south of Soviet Union and Kusnetz coal mining district located in Siberia. Owing to this reason pig iron has to be transported at a distance of 1000 to 2350 kilometers, which not only greatly increases the cost of the pig iron, but also brings about an unnecessary overburdening of the railway lines.

Such a condition makes it necessary to organize the production of pig iron at the above mentioned machine building centers.

Up to the present time this had been impossible owing to the lack of fuel for blast furnaces in these districts; raw ore being present in the form of calcined pyrites such as waste produced while preparing sulphuric acid.

At present the problem of utilizing peat as fuel for the blast furnaces combines with the problem of using calcined pyrites as raw material for producing pig iron.

The advantage obtained from utilizing peat as fuel for the blast furnaces in order to produce high quality pig iron becomes obvious, if we take into consideration that blast furnace coke produced in the Donetz coal district contains from 2 to 2.5 per cent sulphur; while the sulphur content of the peat does not exceed 0.3 per cent. The phosphorous content of the peat ash is equal to 0.5—1.0 per cent. The phosphorus content of the peat is equal to 0.04-0.05 per cent.

Thus, by using peat it is possible to produce high quality pig iron.

In order to find out whether it is possible to use peat in the blast-furnaces an experimental blast furnace smelting was performed under the supervision of a committee of well-known Soviet metallurgists at the Kosogorsky iron works situated to the south of Moscow at a distance about 200 km (near town Tula).

This test lasted one month—October, 1932. Machine-moulded peat, which was obtained from the Leningrad and Moscow districts, was found to be quite suitable for the coking process. It contained from 17 to 25 per cent moisture and 2 to 7 per cent ash.

The size of the peat brick used during the smelting test was standard and equal to about $3\frac{1}{4} \times 3\frac{1}{4} \times 13\frac{1}{4}$ in., which was found to be too long and inconvenient for charging the furnace.

The product obtained from agglomeration of calcined pyrites was used as essential ore. Its average Fe. content was equal to 57 per cent; SiO_2 —14 per cent; Sulphur—0.15-0.40 per cent; Phosphorus—from traces to 0.11 per cent; FeO —16 to 24 per cent; Copper

—0.31 to 1.35 per cent. The agglomeration product appeared to be quite suitable as a raw stock to be used in the blast furnace even when its content in the ore charge was equal to 100 per cent.

The purpose of carrying out this experimental smelting test was to prove the possibility of producing pig iron by means of using peat in coke blast-furnaces; with an effective (useful) height and capacity equalling to 20.8 m. and about 348 cub. m. respectively. Diameter of hearth was 3.4 m.

In 1923-1924 the possibility of producing pig iron on a commercial scale proved by means of using peat or a mixture of peat and wood as fuel in charcoal blast-furnaces with a small daily output from 22 to 49 tons and by means of using metallic turnings instead of iron ore. Whereas the moisture content of peat has been usually from 22 to 26 per cent and even more up to 50 per cent.

In 1925 the possibility of producing pig iron on a commercial scale was proved by means of using peat alone as fuel with moisture content from 15 to 25 per cent and iron ore (calcined siderite—Fe—38 to 45 per cent) in charcoal blast-furnaces with daily output from 14 to 27.8 tons.

In 1932 above mentioned tests of using peat as fuel for coke blast-furnaces gave favorable results.

The conclusion made by the committee of metallurgists under whose supervision the experimental smelting operation was carried out is as follows:

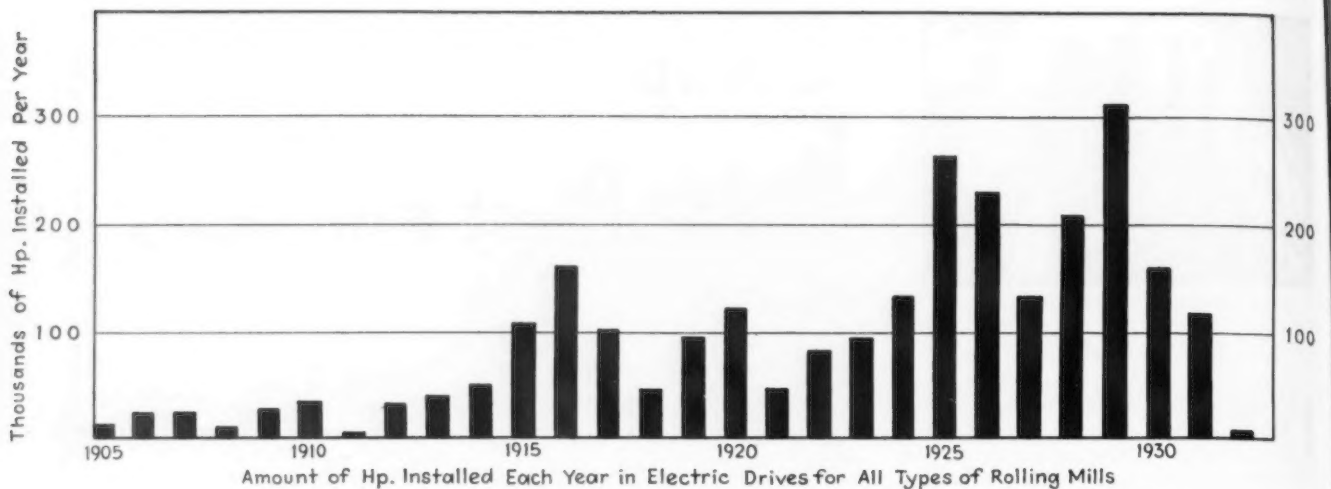
Peat with a mean degree of decomposition is suitable for blast-furnace smelting. It should contain not more than 30 per cent moisture and 3 per cent ash. It is necessary to maintain the intensivity of the smelting by means of properly supplying the blast, assuming that the peat consumption is equal to 1.1 ton per cubic meter of effective capacity of furnace.

Notwithstanding the peat and peat-coke, which is obtained out of it in blast-furnace, burns easily the temperature of the blast should be near the possible maximum 750 deg.-800 deg. C.

Pressure corresponding to 35-40 cm. Hg with the effective height of the furnace equalling to 20.8 m. was

(Concluded on Page 47)

THE use of peat as a fuel in blast furnaces is an interesting Soviet development. The U.S.S.R. contains more than two-thirds of the world's peat bog area. Heretofore, this peat has been used for firing steam boilers. Mr. Suslov tells of recent engineering accomplishments in the use of peat in blast furnaces in combination with calcined pyrites. As a result of these tests, furnaces particularly adapted to this fuel will be designed and constructed in the central Soviet districts.



Advances in Electrical Applications to M

A COMPREHENSIVE survey of developments in manufacturing equipment in the current year, encompassing largely the advances made in electrical apparatus, was presented to the recent meeting in Pittsburgh of the Association of Iron and Steel Electrical Engineers by W. H. Burr, chairman of the association's committee on electrical developments and electrical and mechanical superintendent of the Lukens Steel Co., Coatesville, Pa. From this report have been taken the following items covering major features in new equipment, the complete report touching also machine braking, circuit breakers, new wire insulation, lightning protection and meters:

Rotary Process for Making Steel

Of particular interest this year is the new rotary process of making steel. One hundred per cent steel scrap is charged into an electric furnace; the melt is poured into a mold revolving at high speed; the resultant 2-ton circular bloom, 7 x 7 in. in section and 10 ft. in diameter, is sheared into arcuated sections; a flash heat brings these sections up to rolling temperature and they are ready for billet conversion on a breakdown mill. A plant for making steel by the rotary process is nearing completion in Detroit.

Combustion in Open-Hearth Furnaces

No doubt the two most interesting developments in combustion field are: Luminous flame combustion and one-way fired open-hearth furnaces.

On existing furnaces there has been intensive effort to cut fuel cost and shorten time of heats. This has led to new methods of burning fuel in the open-hearth furnaces. A large East-

ern company has been trying a top-fired furnace and a Mid West concern is advocating firing from all four corners.

Real progress has been made in the control of open-hearth furnaces. Constant analyses of existing gases are now possible and furnace combustion regulated automatically from these analyses.

Turbine-Generator Set Out of Doors

For the first time a turbine-generator set was designed for outdoor operation. It is a non-condensing unit and produces 6,000 kw. by reducing the pressure of the 400 lb. steam in a mercury-condenser boiler to 250 lb. for use in the shops.

The principal outdoor feature is a special lagging that covers the turbine casing and bearing brackets as well as the collector rings and exciter. The bearings are equipped with sight-flow indicators located under windows in this lagging. The valve gear parts are all of non-corrodible material to withstand the effects of the weather.

A 65,000-sq. ft. condenser, constructed by electric welding, is the latest mile post in the progress of the art of joining metals. Designing the condenser for welding involved a rearrangement of the shell-strengthening members, in view of which exhaustive tests were made upon a one-sixth-scale model, which showed a strength greater than calculated.

A second 160,000-kw., 1800-r.p.m. tandem-compound turbine-generator was placed in service in the Hudson Avenue Station of the Brooklyn Edison Co. Among the instruments are an interference recorder for rotating parts that will indicate and record a squeak or other sound, a vibration am-

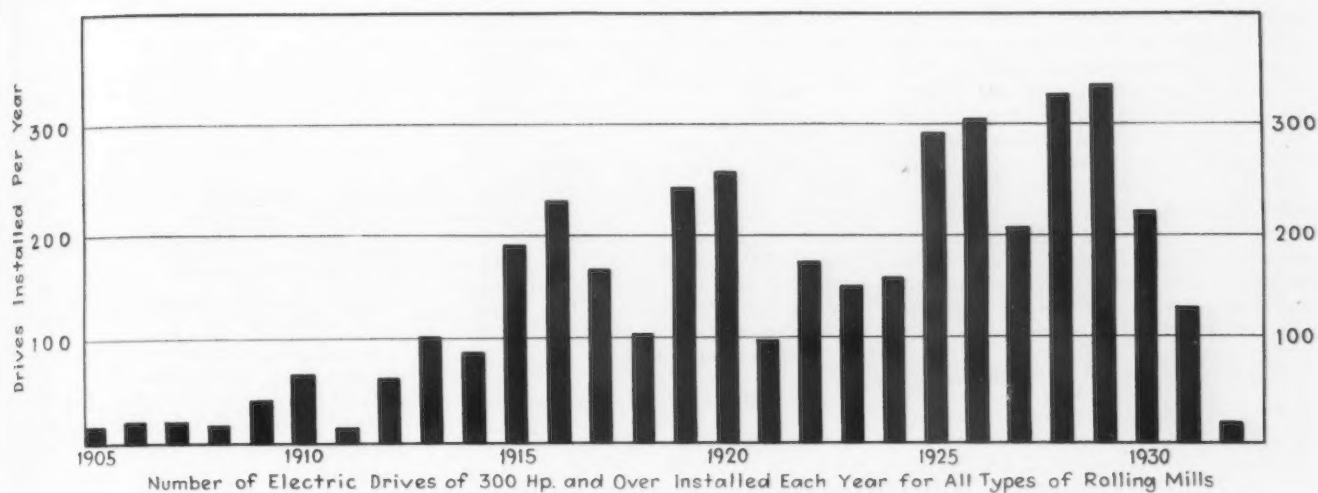
plifying recorder with detectors on each bearing, and Selsyn power amplifiers for the remote operation and indication of valves.

Transformer Developments Numerous

Of interest to steel companies operating electric arc furnaces is the development of a motor-operated, tap changing switch mounted inside the transformer casing. The switch provides for connecting the high voltage windings of the transformer, either delta or Y, and may also provide for two taps on each connection. This switch of course greatly decreases the number of oil circuit breakers required to control a multi-voltage arc furnace. Heretofore, it has been necessary to place furnace and other high-capacity transformers with low-voltage high-current secondaries indoors. Now, however, a low-voltage weatherproof bushing for secondary bus bar terminals is available which permits mounting furnace and similar transformers out-of-doors.

Transformers filled with a non-flammable insulating liquid, called Pyranol, are now available in sizes up to 500 kva. Pyranol is a new non-flammable insulating and cooling medium, which is heavier than water, non-sludging, non-oxidizing, and non-acid forming. Pyranol-filled transformers eliminate the fire hazard of inflammable liquids.

On distribution transformers there has been introduced a detachable stud as well as cable bushing which has its advantage in that it can be attached from the exterior of the case without the necessity of removing the cover. This feature eliminates the necessity of handling tools inside of the transformer case whenever a bushing has to be tightened up or replaced.



ons to Manufacturing Equipment

A number of power transformers of exceptional ratings and physical dimensions were built, some of which were so large that it was necessary to provide specially constructed freight cars for their shipment. Many of the details of power transformer construction underwent a modification in design to utilize in a practical way the results of lightning investigations and to secure a higher factor of safety by the coordination of the insulating values of transformers and the protective elements of power systems.

For the protection of distribution-type transformers, it was found feasible to locate intershunt Thyrite arresters inside the transformer tank, thereby simplifying installation practice and providing a distinct advance in the over-all protection of distribution lines.

An improvement has been made in the coil construction of large transformers used in connection with steel melting and other furnaces, also for various chemical processes. The improvement consists of arranging the primary winding in such a manner with respect to the secondary that practically a uniform reactance exists between the two windings throughout the full range of secondary voltages. This gives a low reactance which is highly desirable on transformers which carry heavy amperes. This construction gives another advantage. A coil so constructed has an additional advantage in the fact that the primary and secondary are practically balanced with respect to one another against mechanical stresses caused by heavy overloads or short circuits.

The new surge-proof transformer combines better-built transformers, more effective arresters, and a better understanding of lightning. The pro-

TECTIVE elements are built inside the walls of the transformer itself; and though the intention is that a ground wire shall be used, the protection is effective even without it. When an incoming surge raises the potential of the high-voltage winding, a pair of sparkgaps flash over to the case, and a third gap flashes over, connecting the case to the ground and discharging the over-voltage and the gaps are self-extinguishing. They invariably interrupt the current in half a cycle or less—so rapidly, in fact, that the primary fuse will not blow, nor an overload relay operate. Even in case the ground connection is missing, the surge is dissipated through the grounds on the secondary.

Electric Furnaces with Controlled Atmospheres

The trend of modern electric furnace development is toward the use of a protective atmosphere in the heating and cooling chambers, to prevent oxidation of material being heated, or in some cases to reduce the oxide already on the material.

Development and installation of two types of atmosphere producing equipment were made. One of these is an ammonia dissociator in which tanked anhydrous ammonia is connected to the coiled alloy tube, which contains a suitable catalyst. The coil is placed in an electrically heated chamber where the temperature is automatically controlled at the proper value. The ammonia gas is dissociated, giving a mixed gas containing 75 per cent hydrogen and 25 per cent nitrogen. This gas is produced at a cost of approximately \$4 per M cu. ft., which includes the cost of ammonia and of electric energy. This figure is based on the price of ammonia in cylinders. If

purchased in tank car lots, this cost may be reduced 50 per cent or more. Such a gas is suitable as a protective atmosphere for practically all applications where hydrogen is suitable, and is much less costly than tanked hydrogen gas.

Another atmosphere-producing equipment was developed to provide an atmosphere of low cost. It consists of a device for controlled mixing of air and gas (either gas or natural gas), a combustion chamber in which the gas is reformed, and a cooling coil where excess moisture is removed. The analysis of the gas can be varied from one that is practically neutral to one that is highly reducing in character, by adjusting the ratio of air to gas. The cost of the atmosphere produced in this equipment is approximately 10c to 30c per M cu. ft. (when using city gas of approximately 500 B.t.u. content), depending upon air-gas ratio and cost of raw gas used. For natural gas, the cost is lower.

New Main Roll Drives

One of the applications which was made in steel mill drives during the last year covers the 1,000-hp., 600-volt, 400-800 r.p.m., direct-current motor driving a 38-in. Steckel mill installed at the Follansbee Brothers Co. plant. This motor is supported from a 750-kw. 80 per cent power factor, synchronous motor-generator set with direct-connected exciter. The control for the synchronous motor of the set is of the automatic reduced voltage type. The Ward-Leonard principle is used in the starting and speed setting of the direct current mill drive with choice of speed under hand control, with automatic acceleration and acceleration under current limit relays.

The new continuous wide hot strip

mill of the Otis Steel Co., which is one of the largest mills of this type in the country, was put into operation. The 72-in. cold strip mill was also placed in service. This is the largest cold strip mill which has so far been installed, each of the two stands being driven by a 1500-hp., 200-400 r.p.m., direct-current motor, while the reel is driven by a 400-hp., 300-1050 r.p.m. motor. The reel motor and control automatically maintain any desired value of tension in the strip between the reel and the last stand.

Automatic Electrical Appliances

Progress was made in the development of automatic equipment for increasing the production of sheet-rolling mills by constructing a simple device which permits the roller to get a fairly exact indication of the length of the sheet after each pass. A small Selsyn generator is geared to the mill so that its speed is proportional to the speed of the sheet through the mill. A Selsyn receiver is connected through a magnetic clutch to a pointer on a dial which indicates the length of the sheet. The clutch is controlled by a flag switch actuated by the sheet as it comes through the mill. When the front end of the sheet depresses the flag switch the clutch is energized, connecting the pointer to instrument Selsyn which is rotating at a speed corresponding to the sheet speed. The pointer then begins to rotate and continues until the tail end of the sheet passes over the flag switch, releasing it. Obviously, the position of the pointer at this instant is an indication of the length of the sheet. The device can either be arranged so that the pointer immediately resets, or it can be held in this position for a few seconds, and then automatically reset.

A Selsyn transmitting and receiving unit combination was adopted to transmit directly to the pulpit the indication of the position of the top roll on a blooming mill.

A combination of Selsyn mechanisms and Thyatron control tubes was utilized for the remote control of a 5 hp. motor, which in turn operates the hydraulic control valve on a 300-ton bloom shear. The position of the shear valve accurately and automatically follows the position of the small master switch which is controlled by the operator.

Thrustors are being increasingly used in the steel mills. A number of them are employed in tilting tables which take the sheets away from the sheet rolling mills and deliver them to the shears. Some of the largest thrustors so far built, rated at 4,000 lb. ft., 18-in. stroke, are used to open the doors of large reheating furnaces. A thrustor is also in use operating the looping mechanism on a 14-in. strip mill. Previously, air, hydraulic, or motor-operated mechanisms were employed.

To meet the demands of the ever changing conditions of modern industry, a 100 hp. motor, less than 12 in. in diameter, has been built which is to supply the maximum amount of power in an almost unbelievable small diameter. Like a dachshund in appearance, this unique motor has the power of motors that are several times in diameter. This induction-type motor is ideal for direct-mounted grinding wheels, saws, cutterheads, etc., where the diameter and peripheral speed of the cutting tool must be held to a minimum.

Screw-Down Controllers

There has been a growing demand from the steel industry for the development of a screwdown controller by means of which the stopping points of the screwdown motor can be pre-set so as to automatically give the proper opening of the main rolls for each successive pass. This demand has resulted primarily from the need for improved quality of product as a result of taking proper drafts.

The screwdown controller as developed permits the setting up of one or several predetermined rolling schedules to take care of various sizes of ingots that may be in the soaking pit and to take care of various sizes of finished blooms to which these ingots are to be rolled. The operator can change instantly from one predetermined schedule to another by pushing a button. It is possible to change one complete schedule set-up to an entirely different one in about a

minute and a half if a rolling schedule entirely different from the ones for which the controller has previously been set up should come along.

To move the rolls from one pass position to the next, the operator pushes a button; the screwdown motor quickly accelerates, slows down in two steps of armature shunt, and is stopped by dynamic braking assisted by a magnetic brake.

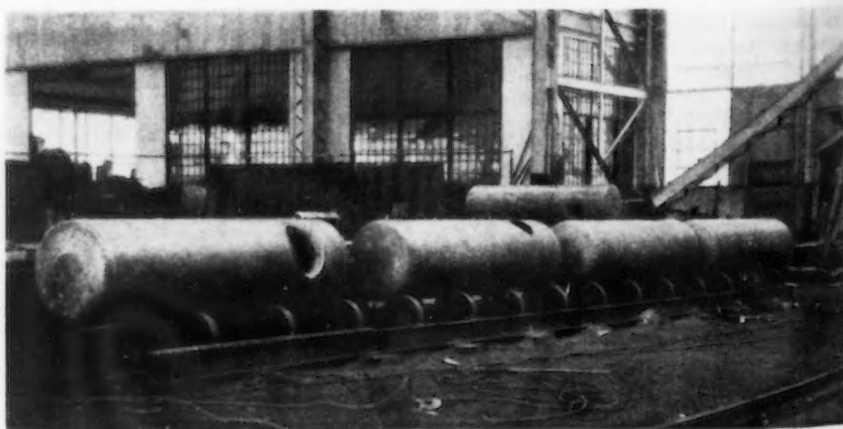
Magnet Lifting Power Increased

An auxiliary controller for a lifting magnet has been developed. This controller is used in connection with the main magnet controller and is for the purpose of increasing the lifting capacity of the magnet. The controller consists of a spring-closed contactor which is opened by a timing device after the circuit has been closed to the magnet. The opening of the spring-closed contactor inserts a resistor in series with the magnet winding.

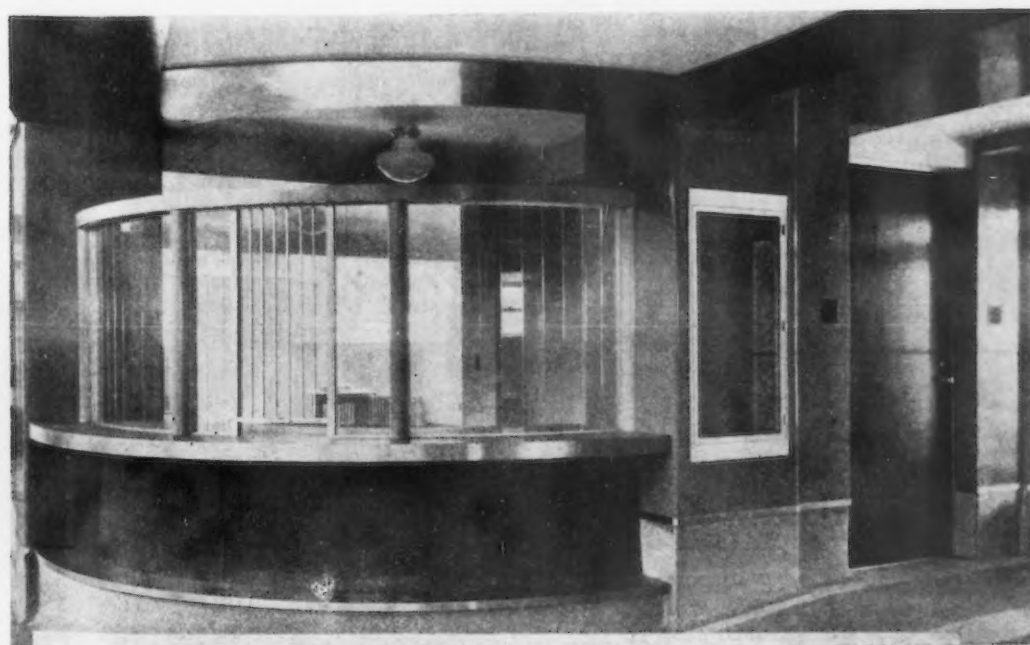
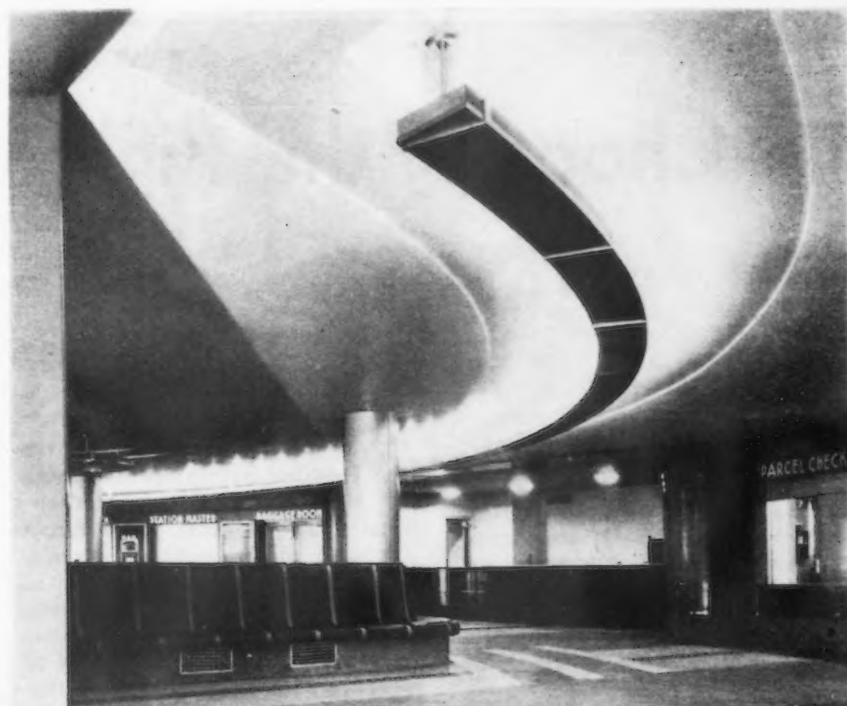
It is well known that after a magnet has reached its running temperature it will not handle as much loose material as it will when cold. The purpose of the auxiliary control is to prevent the magnet from heating so much and to keep its lifting power nearer to that of a cold magnet. Tests have shown that with this auxiliary equipment the lifting capacity of a magnet is increased about 10 per cent. The auxiliary control is only effective where the magnet is handling loose material such as pig iron, scrap and steel turnings.

Carbon Dioxide Brewery Tanks Are All Welded

ALL welded construction CO₂ tanks for brewery service are now being made in the shops of the Chicago Bridge & Iron Works. The shells and heads are made of mild steel, the shells being 7/16 in. thick and the heads 19/32 in. All welds are of the butt type and are made by the arc process. The tanks shown in the accompanying illustration measure 2 ft. 6 in. in diameter by 10 ft. long. They are designed for 250 lb. per sq. in. working pressure and are tested to 375 lb. hydraulic pressure. They are constructed in accordance with A.S.M.E. specifications for class II pressure vessels.



Steel Featured As Interior Finish In New Railway Station



THE new railway station at Hamilton, Ontario, is attracting interested attention from architects and builders in both Canada and the United States because of the successful application of steel in the interior finishings of the building. The manufacture and installation of this equipment was by the Hollow-Metal Division of the Otis-Fensom Elevator Company, Ltd., Hamilton.

The wainscot, doors and frames, counter grilles, column coverings and walls are all steel. The walls are of No. 12 gage steel, finished in baked enamel of a deep terra-cotta color. The column coverings are also of steel, finished in bright aluminum enamel. All fastenings are concealed, and where two sheets of metal join, a small sunken head molding is used at the joint. Curved walls and trim, extremely difficult to execute in steel, have here been handled successfully. Due to the heavy gage of the metal used, there are no rolls and buckles which were so characteristic of light gage metal when used in large sheets.

The use of steel as a wall covering affords opportunities for an almost unlimited variety of treatments. Stenciling, transfer coloring, and etching, combined with the wide range of colored enamels, are a few of the possibilities.

While the conception of steel as a wall covering is not new, the realization of the idea has long been delayed. The Hamilton station is one of the first comprehensive installations of its kind and has aroused wide interest and comment.

Choosing the Right Drive—5

Direct Coupled Motors and Vertical Worm Reductions

ALL methods of the "rigid" system are non-elastic, therefore vibration to a great extent must be absorbed by the particular method employed. If obstruction occurs in the driven equipment the rigid driving unit absorbs the shock, and if accidental stoppage is severe enough, destruction of the driving unit is liable. The rigid installation can be protected somewhat by the use of flexible couplings having torsional resiliency properties, but this is not protection against complete stoppage or sudden overload. A coupling of this type is more useful for absorbing strains caused by high starting torque. Vibration is always apparent in mechanical power installations; in some it is severe, in others normal, therefore the possibility of shock loads and severe vibrations should be considered when installing any method of the rigid system. For normal and heavy steady loads, those having high starting torque and those where accidental stoppage is remote, methods of the rigid system will function efficiently and with low maintenance.

The Direct Coupled Motor Method

Regardless of silent chain, idler controlled belting, V-rope and pivoted motor direct connection to the ma-

▲ ▲ ▲
WITH this installment, the author begins the discussion of the "rigid" system of mechanical transmission. The direct coupled motor method naturally occupies a prominent position in this system and is first dealt with. Gear reductions also play an important part, and a discussion of the vertical worm gear reduction unit method is incorporated in this chapter.
▼ ▼ ▼

chinery of production shops, the term "direct connection" really derives its name from the direct coupled motor connection, because this method is the most extensively employed for this class of work. It is better adapted to integral motor mounting and high speed input driving. A majority of modern machine and wood working tools are designed for high input speeds such as 690, 860, 1150 and 1720 r.p.m. corresponding to the full load speeds of standard a. c. motors operating on 60 cycles. This simplifies the direct driving of such equipment as it makes possible the direct coupling of motor to the driving shaft of the machine. Speed reduction by

other means foreign to the tool is unnecessary. The motor is usually mounted on the machine, or immediately adjacent to it and connection is made by the flexible type coupling. A rigid coupling can be employed, particularly when the motor is mounted integrally, but in most cases the flexible type is preferable, because of vibration and misalignment possibilities. With this method velocity ratio is positive, backlash and slip are avoided and chatter caused at times by other methods is not possible. In process manufacturing plants there are numerous pieces of equipment which require high input speeds such as blowers, exhausters, centrifugal pumps, grinding mills, etc. Speeds from 690 to 1720 r.p.m. are not uncommon, therefore for this service the only alternative is the direct coupled motor connection. In many instances the mentioned equipment is designed to accommodate the motor on its own frame or base, while in others it is necessary to mount the motor separately. However, the usual method in cases of this sort is to mount the motor and machine on one base plate as shown by Fig. 34. In process plant driving the motor should always be connected by a coupling of the flexible type because high starting torque, vibration and possible

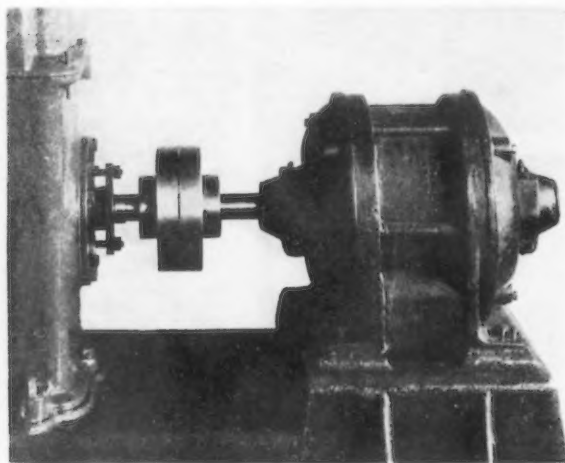
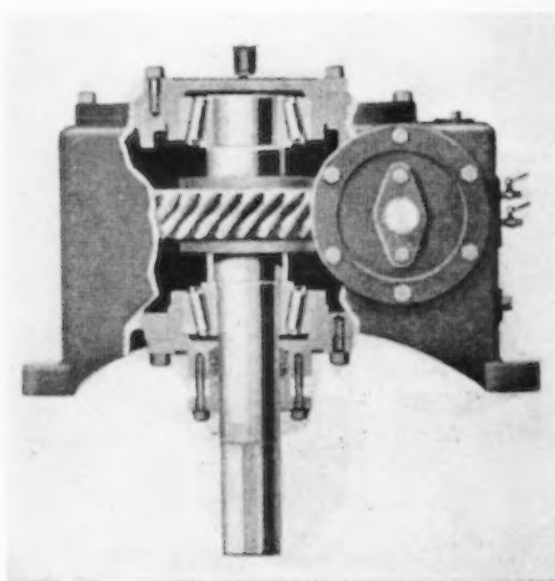


Fig. 34 (above)—An integral base plate for motor and driven mechanism is usual in the direct connected drive.

Fig. 35—A vertical worm gear reduction unit designed so that the slow speed shaft drives from the top of the apparatus.



By **WILLIAM STANIAR**
 Mechanical Transmission Engineer
 E. I. DuPont de Nemours & Co.



misalignment are more evident than in production shop machine driving. In production shop direct coupled driving, based on normal atmospheric conditions, the standard open or squirrel cage type of motor can be employed, which is seldom the case in process plant operations. Acid mists or vapors, dust and lint are injurious to motors. In such operations the totally inclosed motor should be used. Open or squirrel cage motors operating in an atmosphere of inflammable vapors are a fire and explosion hazard. For this service the explosion proof type of motor is essential. In direct process plant driving particular attention should be given to the type of flexible coupling employed, because if the improper type is installed excessive maintenance and increased power consumption will result. For low starting torque steady loads, almost any reputable make of coupling can be successfully used, but where high starting torque vibratory loads exist the torsional resiliency type of flexible coupling should be used.

The Vertical Worm Gear Reduction Unit Method

This method modernizes vertical slow speed shaft driving and eliminates the use of open miter and bevel gear connection for slow speed vertical shafting of reaction vessels, etc. It is not possible to cope with extremely low speeds with the old methods of vertical driving, because of the large amount of gearing, pulleys, shafting and belting involved. The vertical worm gear unit solves such problems because it can be installed as an integral part of the vessel, vat or tank with its slow speed shaft direct rigid coupled to the vertical shaft. Ratios as high as 100:1 are available with this type of reducer, therefore almost any practicable agitation speed can be obtained by direct connecting a motor of the most convenient standard speed to the worm or high speed shaft of the reducer. The modern worm gear vertical reduction unit is entirely en-

closed, operates in oil and is approximately 90 per cent efficient. The slow speed shaft of the unit can be arranged so as to drive either from the top of the vessel as shown by Fig. 35, or from the bottom of the vessel as shown by Fig. 36. To accommodate this method of vertical driving the driven equipment is usually designed to facilitate motor installation in connection with the reduction unit. The motor should be flexible coupled to the high speed or worm shaft of the unit and made integral with it by the use of a base plate of either steel or cast iron. A typical installation of this sort is shown by Fig. 37. The power capacity of units of this character cover a wide range and are in proportion to the ratios. As the power capacity increases, naturally the size of the unit housing increases also, but not solely because of the larger gearing involved. Worm gearing, regardless of the modern method of thread and tooth generation, creates temperature during operation. The necessary rapid radiation of this heat depends to a great extent on the shape and size of the reducer housing, therefore this must be considered when adopting this method of driving based

on space limitations. Lubrication efficiency is most essential to this class of gearing, therefore for low and medium duty moderate worm speed reducers the splash system, where the worm or gear dips into the oil, is generally employed, but for heavy-duty high worm speed units the circulation oiling system should be employed. An advantage of this system over the splash system is that the oil is subjected to less severe service, since by the use of coolers and filters in the system, and by the use of large quantities of oil, the lubricant is kept at a moderate temperature and comparatively free from impurities, thus making for better lubrication and longer service of the lubricant. Furthermore the oil is forced directly between worm and gear teeth at the point of contact in large quantities by pump pressure.

Uses of the Rigid System

With the exception of the direct coupled motor method, the use of the rigid system methods of driving in production shops is extremely limited. They are a necessity in process plant driving, because of the mechanical transmission demands and the power

Production Shop and Process Plant Driving

METHOD	Direct coupled motor connection.		
SERVICE	<p>Direct driving of machine and wood working tools where the input speed demand corresponds with that of standard or special motors.</p> <p>Direct driving high speed equipment of process plants such as fans, blowers, exhausters, centrifugal pumps, mills, cutters, etc., where such speeds correspond to that of standard motors.</p> <p>Where space is limited and compactness of drive is imperative.</p> <p>Where shock is negligible.</p>		
STANDARD 60 CYCLE MOTOR SPEEDS AT FULL LOAD	575 - 680 - 860 - 1150 - 1720 - 3500 r. p. m.		
COUPLINGS	High Starting Torque	Low Starting Torque	Low Powered, Low Starting Torque Connections
	Flexible type having torsional resiliency qualities	Flexible type torsional resiliency qualities not necessary.	Rigid flanged or flexible type.

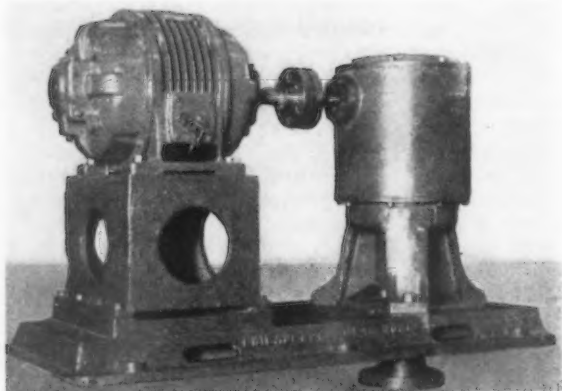
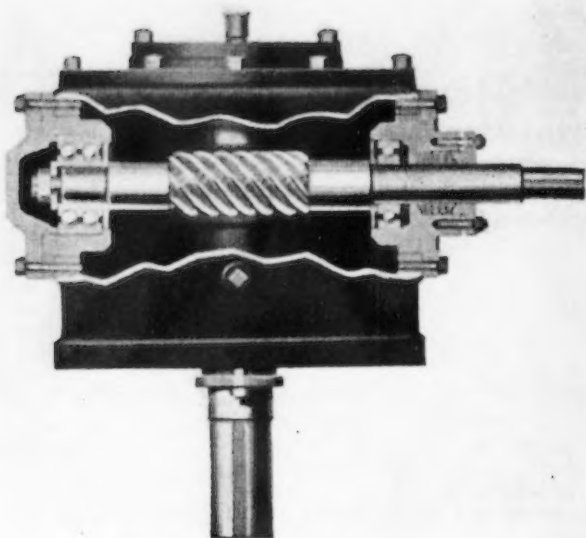


Fig. 36 (upper left)—In this case, the slow speed shaft is arranged to drive from the bottom of the apparatus or vessel.

Fig. 37 (at left)—Motor application is facilitated, in the case of worm gear reduction, by the use of an integral bed plate.

Fig. 38 (above)—Reducer housings may be obtained with the necessary clearance to enable the stuffing box to go below the top surface of the tank or vessel.

and ratio requirements. Probably the most universally employed pieces of equipment in the process and chemical industries are reaction and pressure vessels, mixing tubs or vats and agitation tanks. All such equipment invariably operates in connection with agitation or stirring, which necessitates a vertical driven shaft integral with the vessel. Agitation or stirring speeds of 5 to 10 r.p.m. are frequent occurrences, therefore based on the usual necessity of direct connection when the equipment is of sufficient power requirement, the vertical worm reduction gear unit can be employed to an advantage. Ratios of 100 to 1 in single reduction reducers can be obtained, but it is advisable not to exceed 80 to 1, because beyond this the efficiency of the unit drops rapidly. The driving of agitation vessels has been particularly discussed because it is the most extensive field for this type of reduction gear. However, the use of the vertical unit can be considered for any installation where direct connected vertical slow speed driving is essential. It frequently happens that the vertical agitator shaft of a vessel when driven from the top is unsupported at the bottom. For such a condition it is imperative that a bearing be provided, preferably integral with the vessel or tank, immediately beneath the lower bearing of the reducer, otherwise severe transverse

strains on the gearing and bearings of the reducer will occur, due to possible bending action on the shaft. This is particularly liable if a viscous material is being agitated or if the agitation results in a heavy precipitate. Where 1 to 3 predetermined speeds of agitation are necessary the vertical worm reduction gear can be employed with a change speed gear

unit interposed between it and the motor. The same results can be accomplished by a standard variable speed motor, but it is more costly and requires more space and headroom. A flexible coupling should be used between both motor and change gear and change gear and reducer. To facilitate alinement the entire unit should be mounted on one base plate.

Process Manufacturing Plant Driving

METHOD	Vertical worm reduction gear unit.	
TYPES	Vertical down-drive.	Vertical up-drive.
SERVICE	For driving vertical shafts of reaction and pressure vessels, agitation and mixing tanks and all manner of vertical driving where power must be applied at the top of equipment.	For driving vertical shafts of reaction and pressure vessels, agitation and mixing tanks and all manner of vertical driving where power must be applied at the bottom of the equipment.
	Where direct connection is essential to this class of driving.	Where direct connection is essential to this class of driving.
	Where head room is limited.	Where head room is limited.
	For slow speed vertical driving.	For slow speed vertical driving.
PERMISSIBLE SPEEDS OF WORM SHAFT	100 to 3600 r. p. m. All standard motor speeds	100 to 3600 r. p. m. All standard motor speeds.
RATIO CAPACITIES	$4\frac{3}{4}$ to 1 to 80 to 1 } Standard	$4\frac{3}{4}$ to 1 to 80 to 1 } Standard
HORSEPOWER CAPACITIES DEPENDING UPON RATIO	$\frac{1}{4}$ to 200	$\frac{1}{4}$ to 200
LUBRICATION	Fluid lubricant by either splash or circulating system.	Fluid lubricant by either splash or circulating system.

There are occasions where other methods for the vertical driving of the equipment mentioned may be lower in first cost, but their installation may involve prohibitive construction costs due to structural interferences at the top or bottom of the driven vessel. To overcome such obstacles the housing of the vertical worm reduction unit is designed so that the minimum amount of head room is required. Most reaction vessels and agitator tanks are, of necessity, equipped with stuffing boxes through which the vertical shaft passes. To accommodate this condition, the reducer housing can be obtained designed for such clearance. In some cases the stuffing box is below the top surface of the tank or vessel. For such construction the flat or flanged base reducer can be employed as shown by Fig. 38. In driv-

ing of this character thrust is always produced due to the angle of the agitator blades or propellers if the drive is located on the top of the vessel and to the weight of the shaft and agitation mediums if the drive is located at the bottom of the vessel. This condition is amply provided for in the reduction unit, therefore no auxiliary thrust bearings are required.

Revised Metal-Cutting Bibliography

IN 1930 the American Society of Mechanical Engineers published, as a research publication, a bibliography on the cutting of metals. This work was compiled by Professor O. W. Boston of the University of Michigan. It included some 770 references

with short abstracts and covered the period from 1866 to 1930. An author and a subject index are provided for the chronologically arranged references.

Since the publication of this bibliography, Professor Boston has compiled an additional 990 references with abstracts, bringing the work up to date. The finances of the American Society of Mechanical Engineers will not permit its publication, however. The work is prepared for lithoprinting in the same general form as the A. S. M. E. publication, and will be published if there is sufficient demand for it. It will sell at a price covering the cost not to exceed two dollars, depending upon the number of copies required. Those wishing copies may communicate directly with Professor Boston, University of Michigan, Ann Arbor, Michigan.

Steel Executives Inspect Fabrication of Intake Gates for Boulder Dam at Westinghouse Plant

FROM left to right: G. E. Stoltz, manager industrial sales department, Westinghouse Electric & Mfg. Co.; Herbert A. May, assistant to president, Westinghouse Company; F. B. Hufnagle, president, Crucible Steel Co., of America; L. K. Harrison, Westinghouse student; E. D. Mills, vice-president, Westinghouse Company; Ralph Kelly, manager central district, Westinghouse Company; F. R. Frost, president, Superior Steel Corp.; F. P. Bell, president, Edgewater Steel Co.; J. E. Lose, vice-president, Carnegie Steel Co.; C. H. Champlain, general works manager, Westinghouse Company; E. E. Goodwillie, assistant to president, Bethlehem Steel Co.; N. G. Symonds, vice-president, Westinghouse Co.; A. W. Robertson, chairman, Westinghouse Company; R. E. Zimmerman, vice-president, United States Steel Corp.; W. W. Reddie, manager welding section, Westinghouse Company; J. J. Kennedy, vice-president National Tube Co.; Ralph Watson, vice-president, United States Steel Corp.; V. Corbett, sales assistant, Westinghouse Company; C. C. Kimball, vice-president, Illinois Steel Co.; E. L. Benedict, vice-president, Pittsburgh Steel Co.; F. A. Merrick, president, Westinghouse Company; K. L. Langrebe, vice-president, Tennessee Coal, Iron & Railroad Co.; J. M. Curtin, industrial sales manager, Westinghouse Company; J. S. Tritle, vice-president, Westinghouse Company; W. E. Watson, vice-president, Youngstown Sheet & Tube Co.; C. C. Brinton, superintendent works department, Westinghouse Company; O. F. Stroman, industrial sales manager, Westinghouse Company.



Improved Cushion Assemblies for High Speed Riveting Hammers

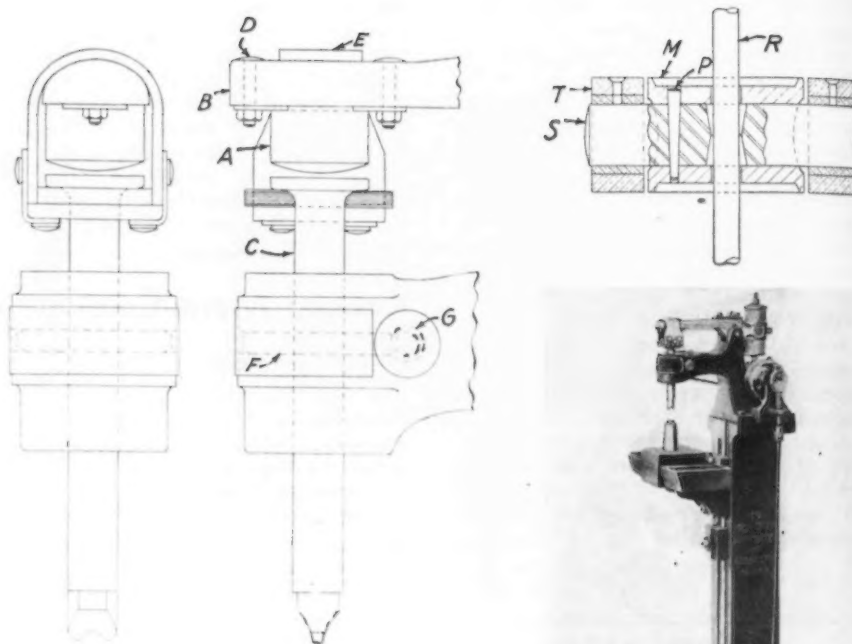
A NUMBER of patented improvements in the rotary type flexible-blow riveting hammers made by the High Speed Hammer Co., Rochester, N. Y., have been announced by the company. These new features can be applied to machines now in use.

An outstanding improvement is in the design and assembly of the rubber cushion A which is interposed between the front end of the hickory helve B and the reciprocating ram or hammer, C. Previously the rubber cushion was held between the helve and ram in a manner that necessitated a relatively tight assembly and the use of tubular rubber cushions, which tended to float during action, causing friction at several points. It also caused a binding effect that restricted the rotation of the reciprocating ram. All this resulted in undue wear on various working parts. It was also necessary to provide a stem in the top of the ram to hold the tubular cushion in position.

In the new design, the rubber cushion is rigidly secured to the under side of the helve so that the helve and the cushion move as a unit. The friction and impact incident to striking the reciprocating ram are confined to the lower face of the cushion, thereby reducing friction to a minimum and prolonging the life of the cushion. Tests are said to have shown that the life of this part has been increased ten times or more.

The new cushion assembly also eliminates the necessity of close tolerances in the length of the strap which holds the ram in assembly with the helve and cushion. The cushion now employed is solid rather than tubular, so that there is now a greater volume of resilient material. As the cushion is rigidly secured to the helve independently of the means for connecting the ram with the helve, the ram is relieved of the binding effect, which permits the ram to rotate more freely when rotation is desired. Finally, the new design eliminates the necessity of disassembling the helve in order to replace the rubber cushion.

Another important improvement is in the rear assembly. Previously the rear rubber cushions were held by two rubber retainers with a wristpin between them and the entire assembly was held by a connecting rod. This

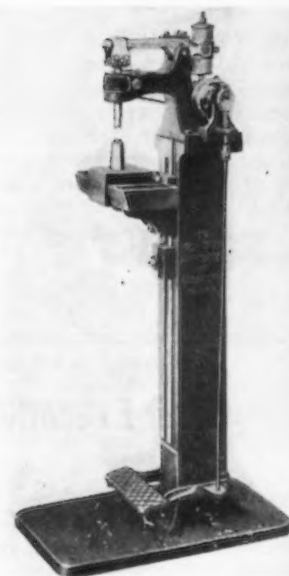


Front cushion assembly improvements of the High Speed riveting hammer are pictured above, and rear cushion improvements at the upper right.

allowed excessive floating of the rubber retainers and wristpin, permitting the wristpin to contact the connecting rod and cause wear.

As now arranged the center rubber retainer, M, is made in one part, and is doweled by pin P that extends through wristpin S. This eliminates

the floating of the wristpin in the rubber retainer, the two parts being held in a constant relative position, and it confines the floating of the wristpin to the bearings of vibrator T. The result is that wear of the connecting rod from oscillation of the wristpin has been eliminated.



Portable Electric High Speed Grinder

FOR tool room grinding of dies, molds and other parts, as well as for use in pattern, welding and repair shops, the Chicago Grinding Wheels Co., 1101 West Monroe St., Chicago, is offering the "Hand-Ee Hi-Power" portable electric grinder here pictured.



Compact, well balanced and weighing only 3 lb., the machine may be used in inaccessible places and for getting into and around corners and into irregular shaped holes. Three grinding wheels are regularly furnished, but over 100 shapes and sizes of the company's wheels are available.

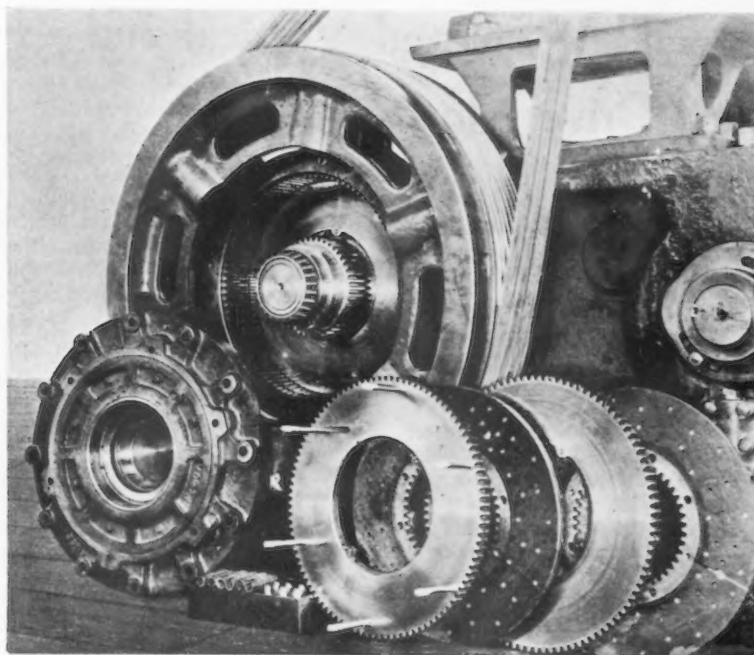
The machine is equipped with a universal motor and has a maximum speed of 17,000 r.p.m. High-speed dust-sealed ball bearings reduce friction and eliminate overheating. The motor housing is made of cast aluminum and extends out over the motor shaft as shown. This portion of the housing is incased in a fully-insulated cushion grip which gives the operator positive control and greater flexibility in using the tool. Balanced, case-hardened chucks are regularly supplied.

Quick-Acting, Multiple-disk Clutches Operated Pneumatically

QUICK-ACTING, pneumatically-operated clutches in capacities from 100 to 1000 hp. at 100 r.p.m. have been placed on the market by the Ajax Mfg. Co., Cleveland. Although developed primarily for use on forging and other hot metal working machinery made by the Ajax company, these clutches are offered for initial equipment and replacements on all types of stop-motion machines.

By substituting a simple housing for the combination flywheel and pulley rim, the clutches become equally serviceable for purely power transmission applications, such as connecting prime movers with line shafting, pumps, compressors and hoists, where smooth action at high rotating speeds and great torque capacity are essential.

These clutches are of the usual multiple-disk friction type, except that pressure is applied to the friction surfaces by introducing compressed air behind an annular piston that acts directly upon the plates. No toggles, wedges, thrust collars, etc., are employed to transmit this pressure, the only operating parts, aside from the piston and plates, being compression springs for retracting the piston and disengaging the plates when the air pressure is released. Air consumption is said to be small, because of the negligible clearance volume in the cylinder above the pis-



Disassembled view of Ajax pneumatic clutch showing ring-type operating piston assembled in annular cylinder of the side plate

ton and the very short piston stroke, $\frac{1}{8}$ in. on four-surface clutches, $\frac{3}{16}$ in. on six-surface clutches. The construction is emphasized as permitting very quick stopping and starting.

Clutch engagement is accomplished simply by opening an air valve and disengagement by reversing this valve. In stop-motion machines, this valve is timed into the machine cycle, an air-released, spring-set brake stopping the machine at open stroke. Sudden drop of air pressure or breaking of an air line causes instant stopping of the machine.

Inasmuch as the cylinder, piston and heavy cast iron driving plates are in rotation, the only clutch parts to be started and stopped are the driven plates and clutch pinion. These have extremely low inertia value, so that

negligible clutch energy is required for picking them up, and negligible brake power is required for stopping. Instant response of the clutch to the operating valve makes it possible to "inch" slides for die setting. By using a small secondary air cylinder or a solenoid for actuating the air valve, multi-station or remote control is possible.

Construction of the clutch may be seen in the illustrations. The flywheel and its driving parts are carried on the shaft upon anti-friction bearings, lubricant in which is retained by leak-proof grease seals. Driving disks are of alloy cast iron, and the driven disks are of steel plate, machined on their faces for flatness and faced with molded, heat and wear-resisting friction material. Thorough ventilation from hub to rim has been provided.

Where dust and dirt are prevalent, the clutch housing can be made tight to prevent damage to the friction plates from foreign matter. The heat is then dissipated through the outer surface of the housing.

Convenient and accessible adjustment to compensate for wear of the friction surfaces is provided by means of six self-locking screw plugs on the inner side of the clutch housing. Clutch power is not varied by this adjustment. The friction plates and piston are made accessible by removing the outer side of the clutch housing; this does not disturb the remainder of the assembly.

These clutches are being manufactured with friction plate diameters of 18, 21, 24 and 30 in., but it is planned to build them in smaller and larger sizes. Patents are pending.



Rotary air shaft connection, bearing adjusting cap and removable side plate are shown in view at right. A 30-in. Ajax clutch flywheel with splined outside driving ring is pictured above.



Offers New Pivoted Vertical and Ceiling Drive Motor Bases

THE Rockwood Mfg. Co., Indianapolis, is introducing the new vertical drive motor base and the new ceiling drive motor base here illustrated. The vertical drive base is designed to maintain the correct tension on both pulleys, and thus eliminate belt slip and loss of speed that results when the belt falls away from the lower pulley, due to inevitable belt stretch.

As in all Rockwood drives, the motor is mounted on two adjustable, horizontal arms suspended from a pivot shaft. But in this vertical drive, the weight of the motor is counterbalanced by two coiled springs, connected by rods to the bracket arms. These springs are adjustable and provide the required belt tension.

When the motor is located above the driven pulley, the springs are adjusted to support the entire motor weight plus the necessary belt tension. When the motor is below the driven pulley, the springs are adjusted to support only that portion of the motor weight not needed to provide belt tension. Adjustment is made merely by turning the two nuts at the ends of the coil-spring rods. The belt tension may be established quickly and accurately by the machine operator, and may be changed instantly and as often as desired to different operating loads.

To simplify locating of the motor relative to belt length at time of installation, and to provide adjustment for elongation of belt in service, the pivot shaft is movable vertically by

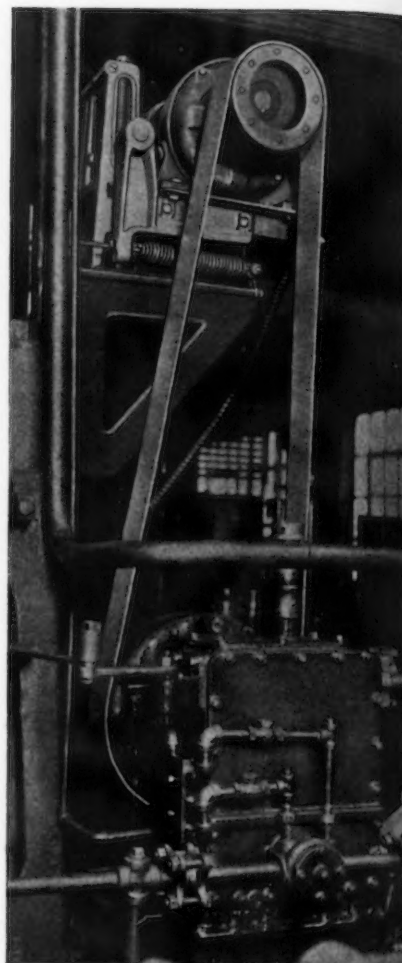
means of convenient adjusting screws. This vertical adjustment for belt stretch and the aid which the screws provide in securing alinement of the two pulleys so that the belt will track, are emphasized as exclusive features.

It is pointed out that on machine tools that operate under varying loads, due to light and heavy cutting, the vertical drive base illustrated is advantageous, as it permits the machine operator to adjust belt tension easily and quickly to suit any change in load conditions.

Ceiling Drive Base Permits Quick Change of Belt Tension

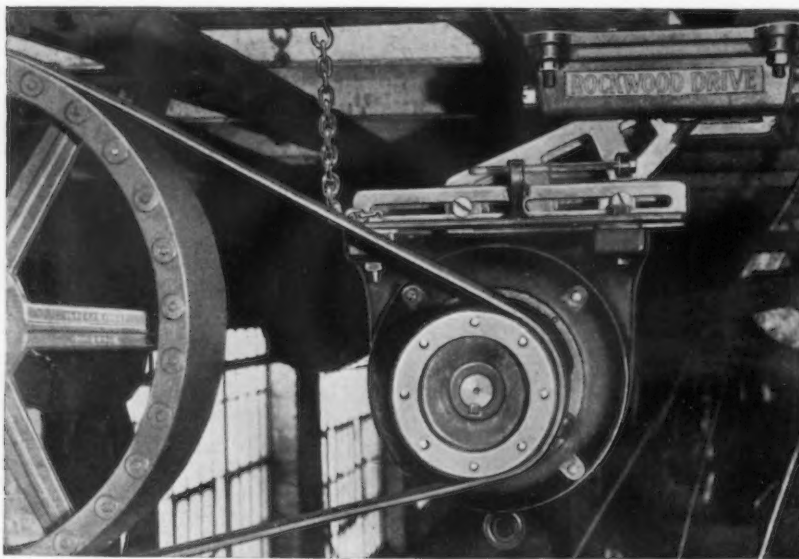
The ceiling drive base is designed to give the same full range of tension adjustment as floor mounted bases. Belt tension adjustment is said to be made more conveniently, however, than in the ordinary horizontal drive. Ease of installation, clean and quiet running and long life for belt and bearings are advantages claimed. Once the proper belt tension has been established the weight of the motor, lightly cradled in the belt, automatically keeps the belt at the proper tension throughout its life.

The ceiling drive base is similar to the standard base except that it has special hanger arms which suspend the motor horizontally, and give greater clearance from the ceiling. Adjustable steel angles which move horizontally on the hanger arms are supported by a ledge cast on the bottom of the arms. This ledge carries

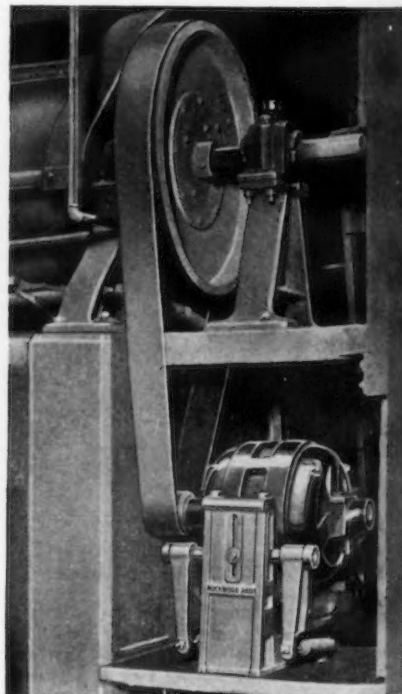


Vertical drive base applied to press oil pump drive.

the weight of the motor and takes the weight from the slotted-head screws in the arm slot. It is important not only in giving added strength and safety to the motor support, but also



Application of the vertical drive base to foundry tumbling mill is shown at right. The springs absorb excess motor weight. A typical arrangement of the new Rockwood ceiling drive motor base is pictured above. One man working overhead from a ladder can readily make belt tension adjustments.



in permitting the screws to be loosened and the adjustable angles to be moved along the ledge simply by turning the secondary arm-screws while the drive is running, so that one man can quickly make any desired change in the belt tension.

The new hanger arms are strong and rigid, and it is stated that there

is no danger of the motor falling either when in operation or while being adjusted. The auxiliary pair of screws on the hanger casting serve to move the motor relative to the pivot shaft without having to support the motor weight independently while the change is being made. One man working overhead from a ladder can

make the change; all he does is to loosen the screws in the arm slots, and then move the motor forward or backward, to obtain greater or less belt tension, by means of the adjusting screws on the arms. This done, he retightens the screws in the arm slots and turns the nuts on the pivot-shaft screws.

Double-Spindle Miller Has Variable Speed

A COMBINATION of double spindles with variable-speed drive features the No. 3 RV-DS milling machine announced recently by the Kent-Owens Machine Co., Toledo, Ohio. Center distance between the spindles is adjustable over a wide range; this, with the variable-speed spindle drive, adapts the machine for a wide variety of operations. Furthermore, adjustments in spindle speed and center distance to allow for cutter wear can be quickly made. Two standard ranges of spindle center distance are available, namely, 4 1/4 to 7 5/8 in. and 5 3/4 to 9 1/4 in.

Any 3 to 1 spindle speed range can be had, the minimum being 40 r.p.m. and the maximum, 457 r.p.m., with an 1160 r.p.m. motor. The standard speed range is 58 to 174 r.p.m. The spindles have a No. 10 B.&S. taper with 17/32-in. clearance hole through, and are mounted in Timken roller bearings both front and rear. A 5-hp. motor is usually employed.

The drive from the motor to the backshaft is through a Vee-flat belt, which runs on a plain pulley on the backshaft and between two opposed cones on the motor shaft. Moving

the motor toward or away from the backshaft increases and decreases the spindle speed, moving of the motor being accomplished through a handle at the front of the machine.

A 4-in. belt transmits the power from the backshaft to the lower spindle, and a self-adjusting idler keeps the belt tight at all times. The upper spindle is driven from the lower through two intermediate gears, which are adjustable for center distance between the spindles. The table has working surface of 7 x 28 in., and can be fed 17 1/2 in., either manually or by power. Cross saddle feed of 7 in. is provided.

Roller Bearings for Industrial Applications

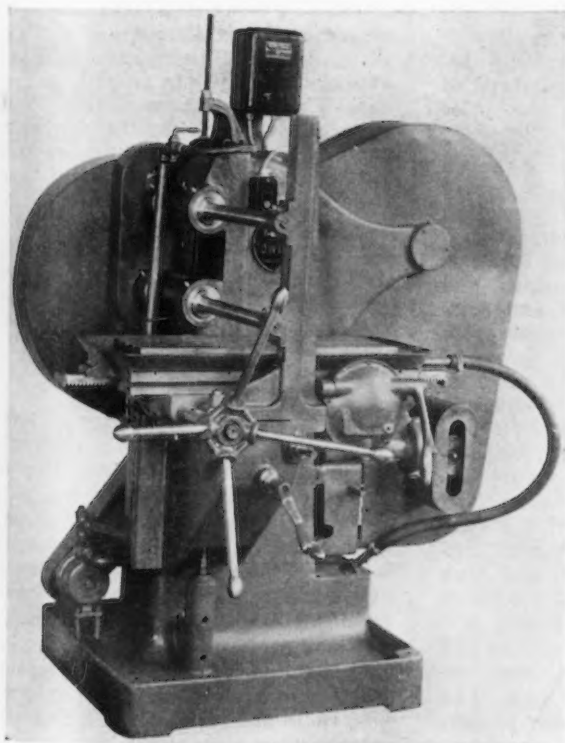
A NEW line of roller bearings for heavy-duty industrial service has been developed by the Fafnir Bearing Co., New Britain, Conn. Sizes for shafts up to 7 3/4 in. in diameter are made.

Alloy steel having a very high

fatigue value is employed. Rollers are of high-carbon chrome steel, and are hardened throughout. They are held in place by spacer bars rather than by rivets through the rolls themselves, a construction that permits use of solid rolls, resulting, it is claimed, in high load capacity and long life. The spacer bars, riveted to the end rings, keep the rollers accurately aligned.

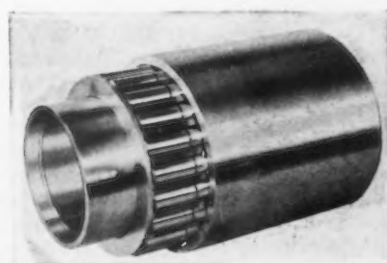
Use of two-part rollers that prevent the possibility of skewing is an additional feature. The entire roller bearing assembly is made with a fixed radial clearance to allow for the expansion that takes place when the inner ring is shrunk to the shaft. This clearance also permits a certain amount of expansion due to heat of operation to be taken care of without seriously affecting the relationship of the bearing parts.

A pillow block employing the new roller bearing has also been brought out by the company. This block is furnished with bolted-on end covers to facilitate assembly and disassembly. A standard single-roll radial ball bearing, substituted for the conventional bronze plate thrust carrier, takes care of thrust loads in either direction.



The new Fafnir industrial roller bearings (at right) are made for shafts up to 7 3/4 in. diameter. They are used in the pillow block shown below.

Wide range of adjustment of center distance between spindles, together with variable-speed spindle drive, adapt the miller shown at left for a variety of operations.



▲▲ LETTERS TO THE EDITOR ▲▲

Damping Factor of Cast Iron

Editor, *The Iron Age*:

TO Mr. Everett Chapman's article on Diesel engine structures, appearing in a recent issue, I beg to add another factor to the two he mentions as being important when weight reduction is considered in crankcases. The factors already mentioned are modulus of elasticity and endurance limit of the material. To these I would like to add that the capacity of the material to damp vibration is equally if not more important than the other two.

Undamped vibration may be compared, in its final effect, with stress concentrations in fillets, in that resonance stresses multiply to a value which may exceed the endurance limit of the steel as it comes from the maker. It has been shown by O. Foppl, of Brunswick, Germany, and others in this country, that by using a material of high internal friction this critical vibration is reduced to such a degree that even a lower fatigue limit is not exceeded in service. I therefore feel that any discussion of "fatigue limits" is not complete unless the damping factor is discussed.

Although many modern cast irons possess higher moduli of elasticity than the 12,000,000 mentioned in this article, thousands of Diesel engine crankcases having the above mentioned elastic properties have given years of uninterrupted service because the damping capacity of gray iron is greater than any other structural metal. Until recently specific information on damping has been so meager that many have regarded gray iron's successful performance in reciprocating machinery to be due to its massive parts and sections. This is only part of the story as recent investigations by H. F. Moore, J. B. Kommers and others will testify.

Prof. Moore associates the term "crackless plasticity" to these new properties and has further shown that it is responsible for the superior ability of gray iron to resist the stress concentrations in fillets, tool marks and other surface imperfections without the development of fatigue cracks. This property has, in a sense, been the silent partner of designers of cast iron parts in the past and, as is often the case, the application of the same design method to a different type of construction results in grief.

I congratulate Mr. Chapman in his recognition of this problem in the last half of this installment and its presentation by the use of photoelastic studies. The gray iron industry, too, has its design problems when study-

ing the field of extended uses for its own product. I might cite the use of gray iron camshafts today as an example of the outcome of cooperation between engineer and founder. Further reports from the test laboratories of several automobile companies indicate that the gray iron crankshaft is in the offing. These parts have been shown to stand up better than forgings in many cases and even under such severe cases as when the center bearing was set 1/32 in. off center. The design is greatly modified from the conventional in order that the superior fatigue and bearing properties may be developed to the highest degree. It is thus that close cooperation between engineer and manufacturer may result in a signal advance in industry.

W. Worley Kerlin, Metallurgist,
Grey Iron Institute, Inc.,
Cleveland.

Possibilities of Aluminum-Beryllium Alloys

Editor, *The Iron Age*:

The increasing interest in beryllium as shown in the pages of *THE IRON AGE* prompts me to offer some comment. I am almost old enough to remember the time when aluminum was a laboratory toy instead of a well distributed material of construction. Back in those days all that was needed was an ingenious mind to develop a method of aluminum reduction so that the metal might be commercially available. That needed thing happened in the town of Wooster, Ohio, and today a great tonnage of this metal finds its way into a variety of manufactured articles, not only because it is a well adapted material of construction but because the price makes it competitive.

Some years ago in studying the tin situation and the possibility of finding a substitute, I became convinced that two kinds of materials were needed, one to apply to bushings and bearings and other anti-friction castings, and the other where strength and acid-resisting properties were required. It is this last division which points to the use of beryllium. The price at present is too high for commercial consideration as a tin substitute and so we must wait until some further inventive mind comes to the rescue just as in the former case with aluminum. Alloys of copper and beryllium have already been produced with great tensile strength, elastic limit, and high percentage of elongation, but it seems to me that the big development will come through alloys of aluminum and beryllium, for preliminary investigation indicates that such alloys may be corrosion resisting, with other properties rivaling steel. Picture the fabri-

cation of buildings with a material as strong as steel, weighing not over a third as much, and proof against corrosion. No paint or protective coating will be necessary. The automobile will respond to these characteristics, and machine tools and agricultural machinery will certainly follow in line, with radical changes in design due to the new aluminum-beryllium alloys.

Robert C. Hopkins,
Alliance Brass & Bronze Co.,
Alliance, Ohio.

Heat Lost Externally By a Blast Furnace

THE external heat losses of a blast furnace were recently investigated at length by D. F. Marshall, Sheffield, England, and the results were reported to the (British) Iron and Steel Institute. The studies were made of a stack with a shell 53 ft. high and 18½ and 25¼ ft. in diameter at top and bottom respectively. In the series of tests iron was produced at a rate of approximately 10,000 lb. an hour and the heat losses were found as follows in British thermal unit per pound of iron: By radiation and convection from the shaft, 64.2 B.t.u.; by loss in cooling water in the tuyeres and bosh sprays, 400.5 B.t.u.; by conduction to the ground, 16 B.t.u.—a total loss of 480.7 B.t.u. In discussing the tests and those made by other investigators, Mr. Marshall holds that generally the loss of heat by conduction to the ground has been considerably over-estimated by previous authorities.

To determine the loss of heat to the ground, holes 2 in. in diameter were drilled to a depth of 2 ft. in three concentric circles at distances of 4, 9 and 13 ft. from the outer bosh wall and at six or more points around the furnace. The temperature at the bottom of each hole was determined by lowering a thermometer in a copper tube filled with mercury. A period of 15 to 20 min. was allowed for the temperature to become constant before a reading was taken. After several series of temperatures had been taken, the two outer rings of holes were drilled to a depth of 4 ft. and the series of measurements was repeated.

The Bettcher Mfg. Corp., Cleveland, has been formed as a reorganization of the Bettcher Stamping & Mfg. Co. Additional capital has been put into the company. Calvin Arter, formerly with the Geometric Stamping Co., Cleveland, is president of the new company, F. E. Stinson is vice-president in charge of production, H. P. Ranney, vice-president, and Charles Bickford, secretary. The company will continue to cater to the automobile, radio and railroad fields and will manufacture some specialties.



THE NEWS OF THIS WEEK

Steel Corporation to Announce Monthly Shipments—Unfilled Orders Dropped

MONTHLY figures on the total tonnage of finished steel products shipped by the United States Steel Corp. will take the place of the monthly unfilled tonnage reports issued by the corporation as a result of the requirements of the iron and steel code, according to an announcement by Myron C. Taylor, chairman of the Steel Corporation.

In announcing the discontinuance of the unfilled tonnage reports which had come to be regarded as an important business barometer, Mr. Taylor stated that "under the terms of the steel code contracts and orders for steel, aside from those for definite construction purposes and as to certain specified products, may not be accepted for delivery beyond the expiration of the calendar quarter. Accordingly the tonnage of unfilled orders no longer presents a fair index of prospective activity in the industry as was formerly more nearly the case. The publication of tonnage shipped monthly will indicate the degree of activity of operations from month to month."

In order that previous data may be available for comparative purposes, the corporation issued a statement of shipments by months during 1933, and on Nov. 10 announced that October shipments amounted to 572,897 net tons. As the corporation's October capacity for producing rolled and finished steel products for sale

was 1,616,000 ($19,269,500 \div 310 \times 26$) net tons as of Jan. 1, 1933, October shipments were at the rate of 35.5 per cent. September shipments, totaling 575,161 net tons, represented 35.6 per cent of capacity. Monthly shipments and percentages of capacity for 1933 are shown in the accompanying table.

Empire Reorganization Practically Completed

EMPIRE SHEET & TIN PLATE CO., Mansfield, Ohio, has made further steps in the completion of its organization by the election of the following directors: C. H. Henkel, Mansfield; Harry R. Jones, Canton, who was president of the former United Alloy Steel Corp.; T. O. Kennedy, Cleveland, vice-president and general manager Ohio Public Service Co.; Henry Roemer, president Sharon Steel Hoop Co., Sharon, Pa.; Henry G. Brunner, president Ohio Home Owners' Loan Corp., Mansfield; John B. Putnam, Pickands, Mather & Co., Cleveland; D. L. Ward, general manager Interlake Iron Corp., Chicago, and John A. Hadden, Cleveland attorney. The election of Mr. Henkel as president was announced last week. Other officers have not yet been chosen.

Formation of the Empire Sheet & Tin Plate Co. resulted from the successful completion of the reorganization plan of the Empire Steel Corp., which was carried out by reorganization committee under the chairmanship of Frank A. Scott. The new company recently purchased all the assets of the Empire Steel Corp. except the mortgaged Cleveland plant. The sale was recently confirmed by the Federal Court and the actual transfer of the property to the new company will take place Nov. 15. Substantially all the holders of bonds on the Mansfield and Ashtabula plants

and creditors have accepted the plan. Remaining bondholders and creditors have been given the privilege of accepting the plan up to Dec. 1.

The Mansfield plant has been in continual operation under Mr. Henkel as receiver and is now operating 17 of its 19 mills. Improvements are contemplated by the new company, which is also considering the production of tin plate.

Mississippi Valley Group to Convene

THE fifteenth annual convention of the Mississippi Valley Association will be held in St. Louis Nov. 27 and 28 to lay plans for further activities in its long-standing campaign for inland waterways. The members of the association represent industry, commerce and agriculture in 25 States.

The speakers include United States Senators Bennett C. Clark of Missouri, Gerald P. Nye of North Dakota and Louis Murphy of Iowa, Congressmen Martin Dies of Texas, member of the Rivers and Harbors Committee; W. J. Driver of Arkansas, member of the Flood Control Committee, and Schuyler Otis Bland of Virginia, chairman of the Committee on Merchant Marine, Radio and Fisheries; Major-General Lytle Brown, the retiring Chief of Army Engineers, and his successor, Major-General Edward M. Markham; Major-General Thomas Q. Ashburn, president and chairman of the board of the Inland Waterways Corporation, and Col. Robert Isham Randolph, president of the association.

Important projects to be considered include:

Authorization by Congress of the improvement of additional main channel links in the Mississippi System. "Ear-marking" in the Public Works Administration of sufficient funds to insure the speedy completion of all adopted projects. Adoption by Congress of a more efficient and comprehensive policy of flood control which will include the prevention of erosion and the conservation and economic use of the nation's water resources.

Monthly Finished Steel Shipments of United States Steel Corp.
(In Net Tons)

Month, 1933	Shipments	Per Cent of Capacity
January	285,138	17.7
February	275,929	18.5
March	256,793	15.3
April	335,321	21.6
May	455,302	27.1
June	603,937	37.4
Six months....	2,221,420	23.1
July	701,322	45.1
August	668,155	39.8
September	575,161	35.6
October	572,897	35.5

Recognition in the nation's transportation policy of the rights of the inland water carriers and the adoption by Congress of measures to safeguard them against restrictive regulation and tonnage taxes. Extension of the Tennessee Valley plan to other important tributaries of the Mississippi, including the Ohio, the Missouri, the Arkansas, the Red and the Alabama-Coosa rivers.

Packaging Machinery Group Incorporated

FOLLOWING approval by the President of a code of fair competition for the packaging machinery industry, formal organization of the Packaging Machinery Manufacturers' Institute, Inc., was recently completed at the group's first annual meeting. H. H. Leonard, vice-president and general manager, Consolidated Packaging Machinery Corp., Buffalo, is president of the institute; R. L. Putnam, president, Package Machinery Co., Springfield, Mass., and H. K. Becker, vice-president and general manager, Peters Machinery Co., Chicago, are vice-presidents, and W. J. Donald, 52 Wall Street, New York, is executive vice-president and treasurer.

In addition, the following vice-presidents in charge of divisions, were elected by the board: Kendall D. Doble, vice-president, Pneumatic Scale Corp., Ltd., vice-president in charge of dry filling, sealing, cartoning, lining and wrapping machinery division; E. E. Finch, vice-president, Karl Kiefer Machine Co., vice-president in charge of liquid filling, capping and labeling machinery division; E. A. Metz, vice-president and general manager, F. X. Hooper Co., Inc., vice-president in charge of corrugated and fiber box machinery division, and J. S. Stokes, president, Stokes & Smith Co., vice-president in charge of paper box machinery division. Provision was also made for the establishment of a wire stitcher division and a gummed tape dispenser division and possibly several others.

A new cast-to-shape, oil-hardening die steel known as K.O.H. has been developed by the Kinite Corp., Milwaukee and Fairmont, W. Va. It is particularly adapted for making cast-to-shape dies for use on shorter production schedules, where first costs weigh heavily in the final per-piece cost, but where exceptional resistance to wear is essential. K.O.H. can be cast to any shape with very little machining time required, and dies made from it are quickly made ready to go into production. This steel is a companion product to Kinite, a cast-to-shape steel alloy which, because of its long-wearing qualities, is extensively used in tools and dies on unlimited production schedules.

British Iron and Steel Demand Stronger—Billet Prices Up

LONDON, ENGLAND, Nov. 14 (By Cable).—The pig iron market is firm and two large Cleveland furnaces are restarting. Hematite makers' stocks are negligible, and furnaces are heavily booked. Demand for raw steel is strong and more furnaces are prepared for operation. Billet makers are fully booked and are asking higher prices.

Finished steel demand is improving as more ship and overseas rail orders are placed. General merchant steel demand is broadening.

Tin plate is quiet with output at 65 per cent and most makers well sold to the year end.

United Kingdom exports of pig iron in October were 7500 tons of which 200 tons was shipped to the United States. Total exports of iron and steel were 194,000 tons.

The Continental steel market is affected by dollar movements and consumers are hesitant. Some business with the Far East, North Africa and South America is reported but other markets are not anxious to pay Car-

tel's prices. Japanese competition is keen in India and Dutch Indies.

The Belgian Hainaut Works is preparing to restart after a year's idleness.

Fourth Screw Thread Report Issued

A FOURTH edition of the report of the National Screw Thread Commission, approved April 10, 1933, has been published. Major revisions include the addition of 1½, 3¼, 3½, 3¾ and 4-in. sizes to the coarse thread series; addition of 1½-in. size to the fine-thread series; and the elimination of small machine screw sizes from class 4, close fit. Also the addition of four sizes and pitches to the hose-coupling threads; revision of tolerances for pipe and thread gages; and the revision of specifications for Acme threads, including a new recommended series of diameters and pitches. The volume of the report has been reduced by the elimination of standards for body dimensions of bolts, nuts and screws, and standards for the design of gage blanks except by reference to the latest revisions of other published standards for these products.

New material includes specifications for an 8- and a 16-pitch thread series for special application. A new table of tolerances for gages used in the inspection of class 4, close fit product is also included. Copies of the report, designated as miscellaneous publication No. 141, are obtainable from the Superintendent of Documents, United States Government Printing Office, Washington. The price is 15c. each.

Organize Structural Fabricating Company

THE Lansdale Structural Steel & Machine Co., Lansdale, Pa., has been organized in Pennsylvania to take over the steel fabricating plant at Lansdale formerly operated by the Kirby Iron Works. The plant is completely supplied with cranes, machinery and other equipment and the new company will engage in steel erection as well as manufacture steel framed structures and machinery.

Joseph Roberts, formerly designing engineer for Proctor & Swartz, Philadelphia, is president and chief engineer of the new company, and Norman P. Farrar, recently sales manager for the Harnischfeger Corp., Milwaukee, is vice-president and treasurer.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export	\$9		
Billets, open-hrth.	\$5 10s.	to	\$5 12s. 6d.
Black sheets, Japanese specifications	\$11		
Tin plate, per base box	16s. 9d.	to	17s. 3d.
Steel bars, open-hearth	\$7 17½s.	to	\$8 7½s.
Beams, open-hrth.	\$7 7½s.	to	\$7 17½s.
Channels, open-hearth	\$7 12½s.	to	\$8 2½s.
Angles, open-hearth	\$7 7½s.	to	\$7 17½s.
Black sheets, No. 24 gage	\$9 5s.		
Galvanized sheets, No. 24 gage	\$11 5s.	to	\$11 15s.

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at \$4.86			
*Ingots	\$2 5s.		
*Billets, Thomas	\$2 7s.		
Wire rods, No. 5 B.W.G.	\$4 10s.		
Black sheets, No. 31 gage, Japanese	\$11 5s.		
*Steel bars, merchant	\$3 2s. 6d.		
*Sheet bars	\$2 8s.		
Plates, ¼ in. and up	\$4 1s. 6d.		
*Plates, ⅞ in. and 5 mm.	\$4 3s. 6d.		
*Sheets, ½ in.	\$4 8s. 6d.		
*Ship plates	\$4 10s.		
*Beams, Thomas	\$2 19s.		
*Angles (basis) ...	\$3 2s. 6d.		
Hoops and strip steel over 6-in. base	\$3 17s. 6d.		
Wire, plain, No. 8	\$5 7s. 6d.		
Wire nails	\$5 15s.		
Wire, barbed, 4-pt. No. 10 B.W.G. ...	\$8 15s.		

*Prices as established by European Raw Steel Cartel.

New Specifications for Structural Steel

ON the recommendation of its Committee A-1 on Steel, the American Society for Testing Materials has approved for publication as tentative three new specifications covering steel for bridges, steel for buildings, and mild steel plates.

The specifications for both bridge and building steel call for the 60,000 to 72,000 lb. per sq. in. tensile strength grade of steel. The American Institute of Steel Construction, American Railway Engineering Association and some of the highway departments and building codes have adopted, or will shortly adopt, the so-called medium grade of structural steel and the new specifications are being issued to meet this definite need. It is expected the committee will, in regular course of society procedure, recommend that the new specifications be adopted as standard to replace the existing standards.

The specifications for mild steel plates supply a grade of steel comparable to the existing standard structural grade. There are, however, a number of changes in the new specifications. The specifications for bridge and building steel provide special requirements for rolled base plates over 2 in. in thickness for bearing purposes. These must be open-hearth or electric-furnace steel, of 0.20 to 0.35 per cent carbon. Physical tests are not required for this material. The new specifications also exempt from tension tests flat rolled steel 3/16 in. and under in thickness, shapes less than 1 sq. in. in cross-section, and bars, other than flats, less than 1/2 in. in thickness and diameter.

The yield point of the bridge and building steel must in no case be less than 33,000 lb. per sq. in. Present standard specifications require a yield point of 30,000 lb. per sq. in. The elongation requirements in the steel for bridges are slightly more stringent, with a minimum per cent requirement in 8 in. of $1,500,000 \div$ tensile strength, while the figure in the building steel specifications is $1,400,000 \div$ tensile strength. However, for material over 3/4 in. in thickness or diameter a deduction from the percentage of elongation in 8 in. of 0.25 per cent can be made for each increase of 1/32 in. of the specified thickness or diameter above 3/4 in. to a minimum of 18 per cent for plates, shapes and bars in the bridge steel specification. For building steel the corresponding figure is 16 per cent.

Steel for bridges must be made by either or both the open-hearth or electric-furnace process, while steel for buildings may be made by one or more of the following processes: open-hearth, electric-furnace or acid-bes-

semer; but according to the specifications (A 9—33T), steel plates and shapes over 7/16 in. in thickness which are to be punched must be made by either or both the open-hearth or electric-furnace processes.

One of the notable differences between the new specifications and those previously issued is in the number of tests required. Whereas the requirements in the older specifications call for one tension and one bend test from each melt, with the exception that when finished material from a melt differs 3/4 in. or more in thickness, one tension and one bend test is required from both the thickest and thinnest material rolled, all three new specifications require that:

Two tension and two bend tests shall be made from each melt, unless the finished material from a melt is less than 30 tons when one tension and one bend test will be sufficient. If, however, material from one melt differs 3/4 in. or more in thickness, one tension and one bend test shall be made from both the thickest and thinnest material rolled regardless of the weight represented.

Each of the new specifications also includes a table of permissible variations over ordered thickness, of plates over 2 in. in thickness. This was not incorporated in the older specifications.

The new specifications for bridge steel (A 7—33T) also cover steel for eyebars and require a tensile strength range for eyebar flats unannealed of 67,000 to 82,000 lb. per sq. in. The yield point for this material must be not less than 36,000 lb. per sq. in. In some cases full-size tests for finished annealed eyebars are required, in which case the specifications require a minimum tensile strength of 60,000 lb. per sq. in. and a minimum yield point of 33,000. In these full-sized tests, the minimum elongation in 18 ft. is given as 12 per cent.

The tentative specifications for the plates (A 10—33 T) cover a mild grade of steel suitable for general plate construction. Steel is to be made by either or both the open-hearth or electric furnace process. The tensile strength requirements are 55,000 to 65,000 lb. per sq. in.; minimum yield point, 30,000; and per cent elongation in 8 in. not less than the figure obtained by the ratio $1,500,000 \div$ tensile strength, with the permissible deduction for thick material allowed as in the specifications for bridges (18 per cent minimum). A minimum elongation in 2 in. of 24 per cent is also required.

The actual preparation of the specifications was carried out by subcommittee II, under the chairmanship of A. W. Carpenter, engineer of

bridges, New York Central Railroad. Committee A-1 on Steel is headed by H. H. Morgan, manager, Rail and Fastenings Department, Robert W. Hunt Co., and H. P. Bigler, secretary, Rail Steel Bar Association, is secretary of the committee.

Tantalum Applications Increase

BECAUSE of a gradual reduction in cost of a wider knowledge of its properties, metallic tantalum is finding many new applications, said C. W. Balke, research director, Fansteel Products Co., North Chicago, Ill., in addressing the Western New York section of the American Chemical Society, at Buffalo, Nov. 14.

"Many of the commercial applications of tantalum, which has been produced in the United States for more than ten years, are due to its remarkable resistance to chemical corrosion," Mr. Balke explained. "In this respect it is truly a noble metal, being inert even to aqua regia."

Tantalum was also said to be one of the most satisfactory valve metals known, and to be used extensively in the manufacture of electrolytic rectifiers. In the form of tantalum carbide, the metal is constituent of hard carbide alloys for the manufacture of tools, wire dies, and abrasion resisting surfaces.

"Tantalum carbide is of the same order of hardness as tungsten carbide, but its properties are quite different," Mr. Balke explained. "Hard carbide compositions containing appreciable quantities of tantalum carbide are well adapted to the turning of steel, and its presence practically eliminates all tendency of the tool to crater."

In outlining the production process, it was stated that "all heat treatments or annealing operations on tantalum are carried out in a vacuum, because this metal has a great affinity for the common gases. All mechanical work on the metal, however, is carried out in the air on cold metal. In the annealed state tantalum is exceedingly ductile and can be handled like most ordinary metals. It can be drawn, spun, and welded to itself and to certain other metals, either by resistance or arc welding."

Inland Steel Co., Chicago, has opened a sales office at 1511 Kirby Building, Dallas, Tex., with F. B. McKinney as district sales manager.

Northern Pacific Railway has applied to the Interstate Commerce Commission for authority to build 28 1/2 miles of railroad from Adair to the head of the Grand Coulee in Washington. The construction cost is estimated at \$800,000.

Comments From A German Correspondent

THE American pipe and steel tube industry will be interested in knowing how the constant competition between cast iron pipe and steel tube has been solved in Germany. The representatives of both groups conferred with the representatives of gas works, power plants, etc., with the result that the latter have agreed to specify only steel tubes in future for all water supply lines up to the highest diameter of 650 mm., whereas for gas supply only cast iron pipes will be ordered. This is of particular importance since the German long distance gas supply organizations have authorized 470 kilometers of additional gas lines from the Ruhr to South Germany.

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NO trucks with gasoline motors are being produced in Germany, except for export. Gasoline trucks are unsalable in Germany. Diesel trucks only being wanted. The German State Railways have just placed a contract for 1000 3 and 5-ton Diesel engine trucks.

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WHAT is claimed to be the first important contract for sheet piling of copper-bearing steel has been booked by the Klöckner, Hoesch and Krupp works together for 8100 tons of 0.3-0.4 per cent Cu. steel of special tensile strength and ductility for construction of dams in Egypt. The sheet piling will be supplied in a variety of 23 different sections. The price is not exactly known. Your correspondent was informed, however, that the basis was £8 15s. gold per ton to which extras of 10s. to 25s. per ton were added according to various diameters, lengths, etc.

* * *

THE rumor has been confirmed that a part of the shipment of Polish rails from the Huta Krolewska and Königs & Laurahütte to Brazil (part of the 60,000-ton contract) was rejected by the Brazilian Railways. The quantity rejected exceeds 12,000 tons. Out of 3700 tons of similar rails shipped to Manchukuo 40 per cent were rejected.

* * *

THE German Navy recently launched two small craft, each of 75 tons, having hulls of stainless steel and plates descaled and polished. After experiments made in England and Germany barnacle incrustation of these plates was found to be from 10 to 15 per cent of that with ordinary plates. Of course corrosion has also been eliminated.

* * *

THE Krümpersystem is now being introduced in some of the Ruhr steel works. This system means hard-

ship for the men on regular payroll, but relieves the condition of the unemployed. All skilled men registered in the labor exchange are employed at regular intervals. In the two works, where the Krümpersystem was first started the men work now 8 weeks and then, for 3 weeks, surrender their jobs to others. The rotation is taking place in regular detachments at weekly intervals.

Uniform Costs in Trade and Industry

AS a means of combating the unsatisfactory conditions that have arisen out of uncontrolled price com-

petition and excessive price-cutting, many business men are giving serious consideration to the need for some plan of uniform cost-accounting and reporting specifically adapted to the problems of their trade and industry. The Policyholders Service Bureau of the Metropolitan Life Insurance Co. has prepared a report on the subject, entitled *Uniform Cost Activities in Trade and Industry*. It is the result of a review of the uniform cost experiences of more than 76 trade associations and sets forth, as well, the opinions and ideas of a number of responsible executives.

Procedures entailed in administering uniform cost activities and methods of preparing uniform cost-accounting manuals are discussed. A limited number of copies of *Uniform Cost Activities in Trade and Industry* are available for readers of this publication. Requests may be addressed direct to Policyholders Service Bureau, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.

Last Minute Sales Leads

(Received too late for classification
in our Plant Expansion Section)

Kenilworth Brewing Co., Washington, care of Hyman Goldman, 635 Indiana Avenue, N. W., recently organized, plans new plant at Kenilworth, a suburb of Washington. Cost about \$120,000 with machinery.

Pennsylvania Railroad Co., 15 North Thirty-second Street, Philadelphia, C. E. Walsh, purchasing agent, asks bids until Nov. 23 for steel plates, bars, sheets, wheels, track fastenings, rails, bond wires, etc. (Contract 12-1933).

Constructing Quartermaster, Langley Field, Va., asks bids until Nov. 20 for one combined small arms ammunition magazine and ordnance shop at local field, one practice bomb-loading machine, one ordnance magazine for chemical ammunition.

City Manager, Kenosha, Wis., asks bids until Dec. 1 for new steel standpipe, booster pumping machinery and accessories, valves, pipe lines, etc., for municipal water system. Entire project to cost \$200,000. Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago, are consulting engineers; R. M. Smith, city engineer.

Schmidt Brewing Co., 1995 Wilkins Avenue, Detroit, has plans for addition. Cost over \$75,000 with equipment. G. A. Mueller, 1346 Broadway, is architect.

Norfolk & Western Railway, N. & W Railway Building, Roanoke, Va., asks bids until Nov. 22 for 2500 steel riser plates (Contract AA-635).

Department of Correction, Prison Colony, Norfolk, Mass., asks bids until Nov. 21 for new steel water tank for local service. Bayard F. Snow, 14 Beacon Street, Boston, is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 21 for 11 motor-driven drilling machines (Schedule 1110) for Washington Navy Yard; motor-driven pipe-threading and cutting machine (Schedule 1074) for San Diego yard; seamless steel tubing (Schedule 1086) for Boston, Brooklyn, Philadelphia and Puget Sound yards; five motor-driven engine lathes (Schedule 1070) for Mare Island, San Pedro and Eastern and Western yards; until Nov. 24, 18 motor-driven engine lathes and spare parts (Schedule 1107) for Puget Sound yard.

T. C. Hughes, 1626 South Baltimore Street, Tulsa, Okla., consulting engineer, representing a new company being organized by local interests, will prepare plans for new hydro-electric generating plant near Kaw City, Okla. Cost over \$1,500,000 with transmission lines, power substations, switching stations and other structures.

Division of Purchase, Sales and Traffic, Department of Agriculture, Washington, asks bids until Nov. 24 for 37 galvanized steel lookout towers with 7 x 7 ft. cabs, to be fabricated and assembled, delivery at different points (Proposal 5301).

Louis V. Shaw, 8133 Woodland Avenue, Milwaukee, long associated with local tool and die industry, has incorporated Shaw Tool Co., to manufacture tools, dies, jigs, fixtures, grinders, etc. Production plans have not been completed.

Beaver Dam, Wis., Board of Public Works, closes bids Nov. 21 for complete construction and equipment of new \$210,000 sewage disposal plant and system, designed by Jerry Donohue Engineering Co., Sheboygan, Wis. William A. Gergen is city clerk.

Old Holland Brewing Co., Torrey Court, Detroit, has plans for new addition, including improvements in present plant. Cost over \$60,000 with equipment. G. A. Mueller, 1346 Broadway, is architect.

Roosevelt Oil Co., Mount Pleasant, Mich., plans rebuilding of portion of oil refining plant, recently destroyed by fire. Loss over \$100,000 with equipment.

Detroit Automotive Development Co., 1500 Penobscot Building, Detroit, has been organized by Ralph H. Rosenberg, 416 Cadieux Road, Grosse Pointe Village, and associates, to manufacture internal combustion engines and parts.

Board of City Trustees, Brawley, Cal., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for extensions and improvements in municipal water and sewer systems. Bond issue of \$331,000 has been approved.

Kitsap Brewing Co., Court House, Port Orchard, Wash., L. E. Woolfolk, secretary, takes bids at once on general contract for new multi-story brewing plant. Cost over \$85,000 with equipment. Carl Siebrand, 5016 Twenty-first Avenue, N. E., Seattle, is architect.

Pierce Metals Development Co., Lewistown, Idaho, J. N. McPhail, president, operating mining properties, is planning security issue to total about \$125,000, portion of fund to be used for extensions and improvements, including equipment installation.

National Railways of Mexico, Mexico, D. F., plans new freight terminal in conjunction with passenger terminal at Tampico, Mex., to replace structures recently destroyed by hurricanes and floods, including installation of elevating, conveying, loading and other mechanical-handling equipment. Cost over \$200,000 with machinery.

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New Tin Plate Mill Planned in Australia

WASHINGTON, Nov. 10.—According to reports to the Commerce Department from Consul-General J. K. Caldwell, Sidney, Australia, the Broken Hill Proprietary Co., Ltd., Sidney, has entered into an agreement with Richard Thomas & Co., British tin plate makers whereby the former will obtain the benefit of the English company's long experience in the construction of a tin plate mill in Australia.

Works Councils Show Big Growth in U. S.

THE works council form of employee representation in industry, which was practically unknown in this country before the War, has developed rapidly in the past decade, according to the National Industrial Conference Board, New York. In 1919 there were 196 factories with 403,765 employees which operated under the works council plan and in 1932 767 plants with 1,263,194 employees operated under the system. In 1932 the total membership of the American Federation of Labor was 2,532,261, of which not more than half were employed in factories and mines. Thus, the membership of factory employees in works councils equalled the union membership in industries.

Under the works council plan of

employee representation in industry, representatives of both employers and employees of a factory meet together to confer on complaints, wages, working conditions, pensions, etc. This differs from the system of trade unions in that all matters affecting the welfare of the workers in a factory are determined by joint conferences between workers and the management to whom the problems are familiar.

German Steel Output Down in September

SEPTEMBER production of raw steel in Germany was 631,819 metric tons as compared with 706,308 tons in August. Aggregate production for the first nine months of the current year was 5,413,880 tons, against 4,182,905 tons for the corresponding period of 1932. Rolling mill output was 477,975 tons in September, compared with 511,311 tons in August, making the nine month's total 3,876,147 tons.

To Hot Roll Special Small Shapes

THE Steel Rolling Co., 601 West Twenty-sixth Street, New York, is planning production of hot- and cold-rolled regular and special shapes of wide variety, in sizes up to $\frac{5}{8}$ -in. round or equivalent. Materials will include plain steels, carbon steels,

stainless and other alloy steels, nickel, Monel metal, aluminum, bronze and other non-ferrous alloys.

Closely-controlled electrical heating before rolling, resulting in material that is comparatively free from scale, is a feature. Completely scale-free shapes, pickled after rolling, will also be available, as well as material finished subsequently by cold rolling. In addition, it is planned to supply heat-treated shapes if desired.

It is stated that the company's hot rolling process will make available special shapes for applications where the cost of cold drawn or extruded material would be prohibitive. Such shapes, it is claimed, adapt themselves better to design and processing of products, eliminate waste or material, reduce weight and provide increased strength. J. L. Sussman is president of the company.

The rolling of any type section and general laws and rules governing roll design are admirably presented in the revised edition of "Roll Pass Design" by W. Trinks, published by Penton Publishing Co., Cleveland. Primarily a text book, the work is adequately illustrated and suitable sample calculations are interspersed to extend and refine the knowledge of experienced roll designers. Analyses are made of roll strength, deformation, shapes and arrangements of passes, and roll speed. Die and continuous rolling receive extensive treatment in both a theoretical and practical manner.



West's Largest Pipe-Line Climbs Canyons

FOUR AND ONE-HALF MILE are welded pipe line will soon join Bouquet Canyon Reservoir with the Owens Valley Aqueduct, near Saugus, Cal. The line will form a part of the gigantic system of the Department of Water and Power, City of Los Angeles.

The pipe line under construction is said to be the largest in the West. It varies in diameter from 7 ft. 10 in. to 6 ft. 8 in., depending upon the pressure. At the bottom of one of the canyons crossed the pressure is equal to 400 lb. per sq. in. There the pipe is 1 1/16 in. thick. The pipe and the welds must be able to withstand this tremendous pressure.

The country traversed by the line is extremely rough with unbelievably steep grades, as shown in the accompanying photograph.

Fabrication of the pipe is handled by the Western Pipe & Steel Co. Laying of the line and field welding are done by the Los Angeles Department of Water and Power, using Fleetweld electrodes manufactured by the Lincoln Electric Co., Cleveland.

An idea of the size of this pipe is gained when one learns that it takes 450 lb. of electrode to weld each joint on the job. Thirty-two man-hr. are required to weld the outside of each joint and 24 hr. for the inside. The welding is being carried on 24 hr. a day in three 8-hr. shifts.

PERSONALS

A. E. GOOSEN has been named purchasing agent of the Olds Motor Works, Lansing, Mich., division of General Motors Corp. From 1922 to 1931 he served as a buyer in the purchasing department and the past two years has been assistant to the purchasing agent. Previously he had been associated with the Monroe Automobile Co., Indianapolis, and the Chevrolet Motor Co.

K. C. PLASTERER has been appointed chief inspector of the Olds Motor Works. In 1927 he joined Oldsmobile as production engineer, serving in that capacity until 1930 when he was transferred to the Muncie Products Co., Muncie, Ind., division of General Motors Corp., as assistant to the general manager. In May, 1932, he returned to Oldsmobile as production engineer.

GEORGE B. INGERSOLL, for 32 years associated with the main works of Fairbanks, Morse & Co., at Beloit, Wis., most recently as assistant gen-

eral manager, has been elected city manager of Beloit. He was born in that city and was graduated from Beloit College in 1889 and from the University of Wisconsin in 1893.

ROY M. WELCH has been named as assistant to Frank Purnell, president Youngstown Sheet & Tube Co., Youngstown. He formerly was assistant secretary and assistant treasurer. R. C. STEESE, Youngstown, has been elected a member of the executive committee of the board of directors.

J. P. BOORE, formerly associated with the Pittsburgh Steel Products Co., now the tube division of the Pittsburgh Steel Co., has been made manager of tube sales of Edgar T. Ward's Sons Co., Pittsburgh.

RALPH M. TRENT, for the past five years manager of the St. Louis office of the Pangborn Corp., Hagerstown, Md., has become sales engineer in the Pittsburgh territory for the company.

tional Malleable Iron Co., Guelph, Ontario, and the International Land & Live Stock Co. of Mexico.

Steel Construction Not Affected by PWA

A DECLINE in the bookings of steel construction is usually expected at this season of the year, but it was unusually large during October because the financing of public works has not as yet produced orders for materials. According to reports received by American Institute of Steel Construction, Inc., from 63 per cent of the industry, the bookings in October were 35 per cent less than during September. The shipments, however, were 2 per cent larger, indicating that the shops are rapidly clearing orders on hand and reducing their backlog.

Financial Notes

National Steel Corp. reports earnings in excess of the 25-cent dividend requirement for the third quarter. For the quarter ended Sept. 30, net earnings were \$756,565 after all charges and Federal tax, equivalent to 35 cents a share on 2,156,832 shares of \$25 par value capital stock outstanding.

Earnings for the quarter were affected by labor troubles at the Weirton, W. Va., plant, which started in the latter part of September, also by the increase in wage rates on July 16 which added to expenses an amount equivalent to more than 40c. a share for the period, without any offset whatever in the way of increased selling prices. Ernest T. Weir, chairman of the board, stated in reporting the earnings.

Third quarter earnings compare with \$155,075, or 7c. a share, earned in the corresponding 1932 quarter, and with \$1,532,466 or 71c. a share earned in the previous quarter of the current year. The company's net earnings after taxes for the first nine months of 1933 aggregate \$2,569,876, or \$1.19 a share, as against a total of \$1,662,919, or 77c. a share, earned in the entire previous year.

Wheeling Steel Corp. and subsidiaries report for the quarter ended Sept. 30, net profit of \$263,335, after charges, depreciation, depletion, interest, etc., compared with profit of \$482,143 in the preceding period, and net loss of \$775,352 in the third quarter of 1932. For nine months, net loss amounted to \$56,940, against net loss of \$2,284,813 for the first nine months last year.

Inland Steel Co. and subsidiary companies announce net profit for the quarter ended Sept. 30, of \$623,612.41. This was after deduction of bond interest and depreciation and depletion amounting to \$1,202,212.64. No dividends were declared.

OBITUARY

P. W. GATES, long prominent in the foundry and heavy machinery industry, died Nov. 8 at Chicago. He was the inventor of the gyratory rock crusher and was president of the Gates Iron Co. until it was absorbed by the Allis-Chalmers Mfg. Co. in 1901. He was also president of the Hanna Engineering Works, Chicago, for several years, and was the first president of the National Founders' Association. He was a director of the Hanna Engineering Works, E. L. Lobdell & Co., Chicago, and Great Lakes Engineering Works, Detroit. He was born in Chicago in 1857.

JOSEPH W. DAVIS, the Ohio representative of Synthane Corp., Oaks, Pa., died at his home in Cleveland on Oct. 21.

EARL T. CONWAY, sales manager of the Lansing Stamping Co., Lansing, Mich., died suddenly on Oct. 29.

WALLER TAYLOR, president of the Consolidated Steel Corp., died at his home in Los Angeles on Nov. 7. He was a director of the American Institute of Steel Construction and an outstanding figure in the steel industry on the Pacific Coast. At one time

Mr. Taylor was general manager of the Llewellyn Iron Works and later, when that company was merged with several others to form the Consolidated Steel Corp., he became president.

HENRY E. BULLOCK, chairman of the board of the Illinois Malleable Iron Co., Chicago, died Nov. 9, aged 81 years. He went to Chicago as a young man and entered the foundry business with his brother, the late James C. Bullock. Mr. Henry Bullock was also president of the Interna-



P. W. GATES



▲ ▲ ▲ "THIS WEEK IN WASHINGTON" ▲ ▲ ▲

Aid Sought for Heavy Industries

Both NRA and PWA Are More Concerned With Plight of Capital Goods Makers—Labor's Demands a Hindrance

WASHINGTON, Nov. 14.—The depressed condition of the capital goods industries and the necessity for their recovery, if prosperity is to be restored, are now being emphasized in both Government and industrial quarters. While the outstanding move to revive these industries is the railroad purchase program, partially adopted, through the use of PWA funds, the NRA is manifesting activity in this direction as are makers of such goods in order to promote their movement.

Indicative of the NRA interest is a report by National Recovery Administrator Hugh S. Johnson made in connection with the code of the machine tool and forging machinery industry. The report, made to President Roosevelt, who approved the code last week, said that the industry had suffered more seriously from the depression than almost any other producer of capital goods. Lack of orders, General Johnson stated, had reduced employment from a 1929 high of 41,000 to a low of 9600 as of June, 1933. With increased orders and the application of the 40-hr week as provided in the code, he said, it is estimated the employment should be increased approximately 12 per cent, with payroll increases of approximately 20 per cent.

Industry Sacrifices Mentioned

"These contributions toward reemployment and public purchasing power," General Johnson told the President, "are being made at a sacrifice to the industry, and this condition can be maintained and improved only through early revival of machinery purchasing."

Reports of similar character concerning other heavy industries are being made to the President by Gen-

By L. W. MOFFETT
Resident Washington Editor, THE IRON AGE

eral Johnson, one of which concerned the code for the motor fire apparatus manufacturers. They follow many White House discussions, some of them at cabinet meetings, and special conferences during the past few months.

Railroads Act First

The first concrete result was the agreement between the President and steel rail makers on a rail price prior to purchases by carriers through PWA funds, with the exception of 100,000 for the Pennsylvania railroad which it will buy with its own funds. This carrier, however, has arranged for a loan of \$84,000,000 from the PWA for the purpose of completing electrification between Wilmington, Del., and Washington.

With the approval of the Interstate Commerce Commission, these purchases will be negotiated through the Transportation Loan Division of the PWA. These negotiations have reached the point where they are largely formal, simply requiring application to the ICC and its approval, which will be readily given where there is no intervening legal obstacle. It was Federal Transportation Coordinator Joseph B. Eastman who was the prime mover in urging railroad purchases with PWA funds. Mr. Eastman is a member of the ICC. Mr. Eastman now has under way a survey regarding the retirement, replacement and modernization of locomotives which may bring about good sized purchases of this class of rail-

road equipment or materials for their repair.

Railroad executives do not share entirely the views of some Government officials regarding their requirements. Nor is it believed the carriers will buy nearly so much as they are being urged to purchase. Yet their commitments promise to be sizable, and good headway has already been made in plans for rail purchases. The suggestion that the railroads be supplied with 100,000 freight cars has been met with a report to Mr. Eastman by the American Railway Association stating that surplus rolling stock now in the hands of carriers is 50 per cent in excess of traffic needs. Contention has been made by the PWA that more than 50 per cent of the carriers' rolling stock is obsolete. It will no doubt be difficult to "coordinate" these ideas.

In this connection it is expected that railroad purchases will be stimulated through the offices of Frank C. Wright, chief of the Transportation Loan Division of the PWA and himself a railroad executive. He is vice-president of the Bangor & Aroostook railroad.

Government Will Buy No Cars

It has been definitely decided that the Government will not purchase railroad equipment for lease to the carriers. This was done during the war period. But Mr. Wright has pointed out that during the war the Government took over control of the carriers and having operated leased lines it was necessary for the Government to purchase equipment, then badly needed. Moreover, he believes in as little interference as possible in the commercial relations of railroads and their suppliers. As a result, the purchases will have to be

made directly by the carriers through Government loans. It is not believed carriers in the hands of receivers will be eligible for loans for rail purchases.

Railroads, under the present plan, will be permitted to name their own trustees for equipment trusts, though the PWA will have the power of veto. No single banking house, as was the case during the war, will be allowed to act as trustee and no banking house having common directors with borrowing railroads will be allowed to act in this capacity.

The plan determined upon calls for the purchase by the PWA of trust certificates from the railroads in connection with all equipment loans, except those for steel rails, and 100 per cent of their face value will be paid for the trust certificates. This is unusual inasmuch as 80 per cent of the face value generally is the amount of loans made on trust certificates. Upon approval of the ICC receivers certificates will be accepted. The question as to the eligibility of roads in receivership for steel rail purchase loans is based on the fact that collateral is confined to bonds. It is the view of some officials that rails cannot be made the basis for equipment trust issues inasmuch as rails are a part of the land and right of way of carriers.

Foundry Equipment Makers Suffering

The condition of another important unit of the capital goods industries was brought out at a hearing last Friday on the code of fair competition for the foundry equipment industry. F. G. Smith, chairman of the code committee, said that, in common with other capital goods industries, the foundry equipment group had suffered greatly during the past few years. At present, he stated, the volume of production is down to approximately 12.5 per cent of capacity. During the past three years, he said, companies in the industry had spread work and endeavored to keep the largest possible number of employees on payrolls, even though business did not justify that course. Mr. Smith explained that 1929 was the banner year for employment in the industry but that, so far as production is concerned, employment at present is down to somewhat more than 33 per cent of the 1929 total. Since 1929 production as measured by dollar sales has declined approximately 77 per cent, while employment has declined about 67 per cent.

Labor Unsympathetic

Mr. Smith expressed the belief that if conditions improve as much as the industry hopes under the NRA, employment will be increased at least 25 per cent over the existing level. Should the industry get back to a production of 75 per cent of capacity under the proposed maximum 40-hr. week, he said, all employees normally

attached to the industry would be absorbed. Nevertheless, Frank R. Brown of the metal trades department of the American Federation of Labor urged a work week of 32-hr., with time and one-half for overtime. He also asked for a minimum wage of 50c. an hour instead of the 40c.-minimum proposed.

The same demand by organized labor was made of another capital goods industry, the gray iron foundry industry, at the hearing on its code last Thursday. In this instance, Chester A. Sample, representing the metal trade department of the A. F. of L. asked for a 32-hr. week with a minimum pay of \$16 per week or 50c. an hour.

Even many who are most sympathetic with organized labor have declared that its demands upon the already hard-pressed capital goods industries are retarding the movement of capital goods and are therefore a hindrance to the program of the Government itself. This is held to be a short-sighted view that injures labor itself. The wage demand is not held to be extreme for normal operation, but to be out of the question under existing conditions. The 32-hr. week, however, is believed to be entirely too short and unfair to capital.

Gear Makers' Code Given Brief Hearing

WASHINGTON, Nov. 14.—While the hearing of last Wednesday on the code presented by the American Gear Manufacturers' Association lasted only 20 minutes, Assistant Deputy Administrator George S. Brady found differences which he asked be eliminated through meeting of labor, consumer and other advisers. He urged that they be overcome quickly and indicated that labor felt there should be some changes in the wage and hour provisions.

After H. H. Kerr, president, Boston Gear Works Co., Inc., North Quincy, Mass., speaking for the association, had presented the code, Deputy Brady inquired as to the definition of the term "industry." He particularly desired to know whether the proponents of the code think that manufacturers of replacement gears for their own machines should be brought under the gear code or remain under the code for the machine tool industry. Mr. Kerr said his group felt that manufacturers of machines should have the right to furnish replacement gears for these machines. So long as they manufacture gears only for such replacement purposes, he thought they should remain under the machine tool code. On the other hand, if the same manufacturers produce gears for sale on the open market, they should come under the gear code, it was stated.

W. B. Henderson, representing the

Machinery and Allied Products Institute, Inc., with more than 1000 members, suggested a substitute definition which would specifically except the manufacture of gears for replacement purposes not sold on the open market. Deputy Brady said he did not ask him to be definitely bound by the suggestion substituted but asked Mr. Kerr if, generally speaking, it was satisfactory to proponents of the code. Mr. Kerr replied that it was generally acceptable.

The code provides for a maximum work week of 40-hr., with the usual exceptions covering executives, administrative, supervisory and technical employees and their staffs. A basic minimum wage of 40c. per hour is proposed, with differentials for learners.

The "merit" clause in the code, Deputy Brady pointed out, had been previously ruled out by President Roosevelt.

New Deal May Cost Over 15 Billion

The total cost of the New Deal, including contingent liabilities of the Federal Government, may amount to \$11,735 million, according to estimates of the National Industrial Conference Board, New York. This figure does not include most of the loans being made by the Reconstruction Finance Corporation, and if the R. F. C. is included as an agency of the New Deal, the total estimated liability of the Federal Government is raised to \$15,135 million.

The grand total of liabilities under the New Deal, as estimated by the board, consists of the following items, the figures being given in millions of dollars:

Federal Emergency Administration of Public Works.....	\$3,150
Agricultural Adjustment Administration	
Treasury appropriation.....	100
Processing taxes, 2 years, estimated	1,000
Farm Credit Administration	
Government guaranteed bonds..	2,000
R. F. C.	300
Treasury appropriation.....	185
Home Owners' Loan Corporation	
R. F. C.	200
Government guaranteed bonds..	2,000
Federal Emergency Relief Administration	
R. F. C.	500
Emergency Conservation Works Administration	
Estimated expenditures, 1 year..	250
Tennessee Valley Authority	
Government guaranteed bonds..	50
Federal Deposit Insurance Corporation	
Contingent liability.....	2,000
	11,735
Reconstruction Finance Corporation	
Total lending ability, minus items stated above.....	3,400
Grand total.....	\$15,135

Gray Iron Foundry Code Meets Criticism Over Code Authority and Wage Rates

WASHINGTON, Nov. 14.—Differences over the code authority, labor and other provisions sent the code of fair competition for the gray iron foundry industry back for redrafting. At the suggestion of Deputy Administrator H. O. King, who presided at the hearing on the code last Thursday, a committee from the industry was selected to meet with representatives of the legal division of the NRA to go over proposed changes with a view to revising the code as quickly as possible. Deputy King also asked that the industry select a committee to meet with the Labor Advisory Board to iron out differences over wages and hours. He requested that L. L. Balleisen, New York, representing the Gray Iron Founders Society, Inc., sponsor of the code, sit in at the conference.

The code was presented by Walter L. Seelbach, chairman of the steering committee of the society. Stating that an effort had been made to locate all foundries producing gray iron jobbing castings, the one product covered by the code, Mr. Seelbach said that approximately 1600 were located, most of them small. Of this total 632 are members of the society, representing about 67 per cent of the volume of production. The 1600 foundries, it was pointed out, now employ about 71,000 workers, compared with 99,000 in 1929. Production at present, it was stated, is very low but employment has been spread as much as possible in order to give the largest number of workers some income. Capital invested in the industry was estimated at \$243,000,000.

Industry Defined

Designed to meet certain objections that had been raised as to the original language, C. B. McGrath, president of the Northwestern Foundry Co., and a member of the steering committee, presented a substitute to clarify the definition of the term "the industry." Mr. Balleisen said his group was in full accord with the definition of the industry as circulated among members and felt it should be maintained. Particular concern was expressed by him that manufacturers of castings operating under other codes, such as stove manufacturers, confine themselves to their own fields and to the production of castings for repair and service purposes. Where such manufacturers make castings for general distribution in competition with those produced by the gray iron jobbing casting group, Mr. Balleisen thought they should come under the gray iron code.

An affirmative reply was made by Mr. Balleisen when Deputy King asked if the point would be covered

if competing manufacturers were required to pay the same wages, work the same hours and observe the same rules of fair practice. Deputy King observed that most of the codes covering industries of this type contain about the same requirements. Samuel Duncel, managing director of the Cooking and Heating Institute, said that it is definitely not the intention of his group operating foundries to come under the gray iron foundry code. His group feels, he said, that it naturally has first call on business that arises from servicing its own stoves, etc. Mr. Duncel said his group had no objection if the gray iron industry furnished such castings in the ordinary course of business, provided the parts so furnished were correct and did not make trouble for users of the equipment.

Mr. Montague, representing the Machinery and Allied Products Institute, stated that the new definition of the industry covers certain objections which his group had intended to express since it makes clear the right of the manufacturer of a product to furnish spare parts while operating under the code of his own industry. D. H. Sherwood, representing the Chilled Car Wheel Manufacturers' Association, pointed out that his group had submitted its own code, but said he understood there was some question as to whether or not it would come under the gray iron foundry code. Questioned by Deputy King, Mr. Seelbach and Mr. Montague said that it was not their understanding that the chilled car group would come under the gray iron code.

Southern Foundries Raise Objections

W. E. Dunn, representing the Southern Metal Trades Association, said that if the Founders Society must be mentioned, he thought his group also ought to be defined in the code. Mr. Dunn also questioned the statement of Mr. Seelbach that the Founders Society is truly representative of the industry nationally.

Replying to a question by Deputy King, it was stated by Mr. Seelbach that that there would be no objection to the President appointing more than one non-voting member of the Code Authority. Mr. Dunn declared that the first section of article 3, covering administration, discriminates against all associations other than the Founders' Society. He asked that his group be given representation. The section provides for the appointment of two members of the Code Authority from non-members of the society.

Deputy King inquired as to the number of foundries in the South and was told by Mr. Dunn that there are 359, of which 60 are members of his

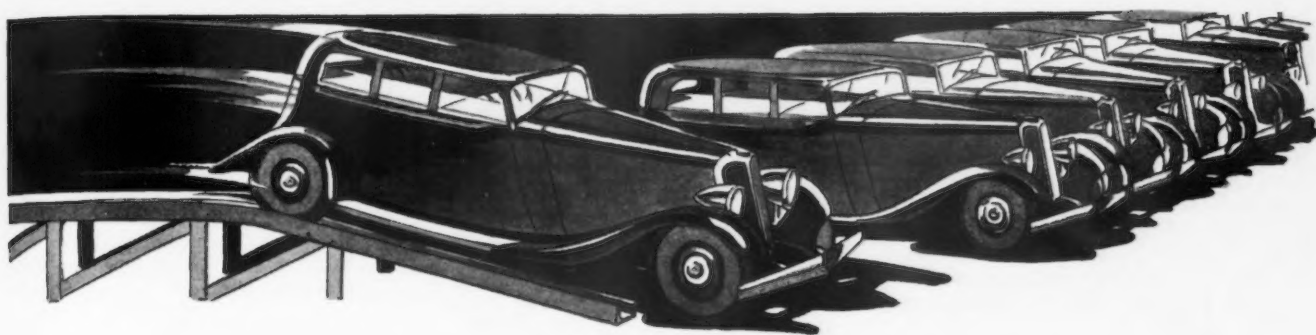
group. Asked whether his association was truly representative of the gray iron foundries of the South, Mr. Dunn said it was 25 per cent representative. Mr. Balleisen, speaking for the Greater New York group; A. B. Root, Jr., Boston, for the New England Foundrymen's Association and Mr. Granston, for the Michigan group, all supported the code as prepared by the Founders Society. W. P. Hazlegrove, representing the Virginia Foundrymen's Association, said his group desired only to be satisfied that under the code his organization would be permitted to set up its own local administrative agency.

In outlining provisions covering rates of pay, hours of labor and other conditions of employment, Mr. Hoadley emphasized the point that section 2 of article 4 might be termed the "merit" clause but said that the language is quite different from that rejected by the President in other codes. Nevertheless, Deputy King indicated that under the ruling of the President he did not see how this provision could remain in the code. Decision was reserved on the deputy's suggestion that the clause be removed.

The minimum rates proposed represent an average increase of 25 per cent for the country as a whole, according to Mr. Hoadley. The Southern rate is 25c. an hour. The average work week is 40-hr. with exceptions for peak demand, etc. Mr. Balleisen objected to what he termed a low average wage in the South and said if continued the competition which the Greater New York group must face would be the same as heretofore.

Chester A. Sample, representing the metal trades department, American Federation of Labor, urged a 32-hr. week and a minimum rate of \$16 per week or 50c. an hour. He also asked that piece work be paid the same as time work and that all overtime beyond 32-hr. per week and eight hours a day be paid for at the rate of time-and-one-half.

In "Democracy, Debts and Disarmament," published by E. P. Dutton & Co., Inc., Walton Newbold presents an unemotional and coldly analytical survey of the workings of gigantic trusts and cartels. The analysis is painted with bold strokes on a world-wide canvas, and the names of famous firms are mentioned to demonstrate how Ruhr steel works or Canadian oil wells are economically interlocked with the life of a Kansas farmer, the prosperity of New York or the seizure of a Tsi-tsi-har railroad bridge. Surveys are made concerning Germany's avoidance of reparations, Japan and the gold standard, Germany supplanted by Japan, etc. The author is a trained financial historian and a member of the Macmillan committee to investigate the operation of the gold standard.



THIS WEEK ON THE ASSEMBLY LINE

Motor Car Sales Surprisingly Good; New Model Production Further Delayed

DETROIT, Nov. 14.

DEVELOPMENTS the past week have been chiefly on the favorable side. A prominent motor car maker has placed sizable orders for materials, half for immediate delivery and the remainder for shipment over the next six weeks. The volume of steel bookings took a turn for the better and although the improvement was small, steel offices look for a very slow but steady gain in sales during the rest of the year. From a tonnage standpoint the market scraped bottom late in October.

More encouraging than the mild upturn in steel, particularly in sheets, are automotive sales figures. R. L. Polk & Co. estimate October passenger car sales at 133,000 units, a decline of only 16 per cent from September. This represents an increase of more than 100 per cent over October of last year. The good showing is attributed largely to well sustained demand in rural districts which tended to offset a considerable loss in metropolitan areas. The relatively brisk sales in farming regions lend support to the Federal Government's statement that even though agricultural conditions admittedly are bad, the farmer's purchasing power has materially improved in recent months.

Retail Sales High

Chevrolet in October made retail deliveries of 50,988 cars and trucks, which is in sharp contrast with the 18,547 in the same month of 1932. General Motors as a whole sold to consumers last month 63,518 cars, compared with only 26,941 cars in October a year ago. Incidentally General Motors last month produced 21,536 less cars than it sold. Optimistic reports are by no means con-

fined to General Motors, for Plymouth dealers delivered at retail 7055 cars during the week ended Nov. 4. During October members of the National Automobile Chamber of Commerce assembled 99,169 units, as against 19,254 in the corresponding month of last year.

Never has the industry been in a better position with regard to field stocks at the end of a year's run. One of the leading car makers privately admits that there is an actual shortage of certain 1933 models in dealers' hands and that for perhaps a month to six weeks its dealers will have little to sell except used cars. There is scarcely a manufacturer who did not make fewer cars than he sold in October with the result that the industry approaches the new model season with a clean slate. While the fact is conceded that almost without exception factories will be slow in starting production of 1934 lines, the exhaustion of field stocks insures relatively good manufacturing schedules in January and February.

November still looms as by far the poorest production month of the year. Chrysler Corp., with a possible 25,000 units for all its divisions, will turn out close to half of the industry's total assemblies. Chrysler's major activities, of course, continue centered in Plymouth and Dodge. For all practical purposes General Motors divisions will be down all month, although Buick hopes to be able to manufacture 1000 cars during the final week. However, it is doubtful whether it will attain its objective. Ford's immediate movements are almost impossible to predict. The Rouge plant is running at a low rate and it is said that production is only 250 to 500 units a day. Current reports have it that some minor alterations are

being made in the present V-eight car for 1934. It is believed that Ford's assemblies in the last four months have been considerably greater than its sales; this is probably the chief reason why operations at Dearborn have declined to such a low point.

New Models Further Delayed

One might expect the settlement of the tool and die strike to quicken the start on new models, but other factors have intervened to push back the date further. Chevrolet, for example, will be about two weeks later than anticipated even a week ago. It will be the latter part of this month before the local plant is in production and the stamping plant at Flint probably will not be under way until after Dec. 1, with initial assemblies coming off the line at various branch plants about Dec. 15. It will be the middle of December before two other companies secure necessary dies. Eleventh hour changes, especially in the line of coil springs and independent suspension of front wheels, are delaying operations of several makers. When these factors are considered, it is obvious that the industry will not be in volume production before the latter half of December. This is scarcely good news for the steel trade. It becomes increasingly apparent that a steel buying movement of large proportions by the automobile industry will not come until January or February. Some attractive tonnages are bound to be placed near the end of next month, but in the light of the volume experienced in the second and third quarters, they will not stand favorable comparison. This statement is made on the assumption that buying will not be artificially stimulated by another stiff boost in steel prices for the first quarter, which might drive

in considerable tonnage prior to Jan. 1.

Streamlining More Popular

As to new models, streamlining will be carried further than heretofore. Chrysler will rely on its De Soto and Chrysler models for its most sensational departures from conventional design. It is understood that the Plymouth and Dodge will be changed but little for the New York Show. It will not be surprising if Mr. Chrysler saves his big punch on these two cars until spring, as he did on the Plymouth this year. The reception accorded the De Soto and Chrysler lines will provide the cue as to the procedure with Plymouth and Dodge. Just which Chrysler cars will have coil springs is not known definitely, but one report declares that all four lines will be equipped with them. Oldsmobile is said still to be earmarked as the style leader in General Motors' ranks, with a six, in addition to its straight eight, sufficiently low in price to put it in competition with Pontiac. Pontiac, with minor changes, is preparing for a major drive which will entrench it more deeply in fourth position in the industry. One of the important quality car makers is reported to be ready to dip down into the upper medium price class to expand its sales, which this year have been less than in 1932. Auburn is said to have elaborate plans for restoring its sales to higher levels. In the first nine months of 1933 Auburn registered 4344 units, as against 10,638 in the same months of last year. The new Nash typifies the advanced body lines of the new cars, although it is not so radical as some cars yet to be revealed.

Mr. Ford, with his Exposition of Progress featuring the making of bodies, the weaving of fabric, the building of tires, the manufacture of wheels, and the machining of parts, has taught his competitors a lesson. They have learned that the public is interested in action and apparently the N.A.C.C. intends to take a leaf from the Ford book. Alvan Macauley, the chamber's president, declares that at the New York show there will be more action exhibits, such as cut-away chassis in motion, precision machinery, demonstrations of processes and features of that sort. The Ford show is definitely scheduled for New York and Chicago, although probably not simultaneously with the annual automobile shows. Admission to the Ford show is free. The N.A.C.C., on the other hand, has always gone on the theory that the public should pay for the privilege of having salesmen at the automobile shows try to sell them cars.

Detroit Notes

Important automotive milestones are being reached these days. General Motors this week starts the celebration of its silver anniversary. Ford's

exposition is in recognition of the progress made in the 30 years during which the Ford Motor Co. has manufactured cars. Next year Chrysler will celebrate its tenth anniversary. . . . Great Lakes has taken off three open-hearth furnaces and now is operating three out of eight furnaces. . . . General Motors, under its new set-up is rapidly moving away from rather than toward centralized purchasing. Oldsmobile as well as Buick now has its own purchasing agent. Oldsmobile is separated entirely from Buick, being strictly "on its own." . . . Buick made retail sales of 41,279 cars in the first 10 months of this year. . . . Car makers probably will start out using silica manganese alloy steel for coil springs, but later may go over to carbon steel. Redesign of the front ends of cars for independent wheel suspension and coil springs is said to call for 40 lb. more steel than is required for current models. . . . A committee of the N.A.C.C. is shortly to make a report on ways and means of stabilizing employment throughout the year in automobile plants, eliminating the sharp seasonal peaks and valleys. . . . Local tool and die shops, with labor disturbances at an end, are able to pick up only odds and ends of automotive die work. The cream of the business for new models went out of the city during the strike. As Abner E. Larned, chairman of the local Regional Labor Board, pointed out, everybody in Detroit has been the loser because of the strike. . . . Sentiment in automotive circles is unanimous in support of Charles Nash in summarily closing down his entire plant as labor trouble developed in the past week. . . . Stories have been circulated to the effect that dies made in outside shops have not fit when they were received in automotive plants. The retailers of such stories apparently do not know that some machining work always has to be done on these dies after they are received so that they will fit perfectly into the presses. . . . Chevrolet this week is awarding contracts for passenger car parts. It is now making 1934 truck parts. . . . There is no truth in stories that the New York show will be postponed. . . . Fisher Body's Cleveland plant is reported to be in production on stamped parts for the new Chevrolet and Pontiac cars.

Production of cars by the Chrysler Corp. during October totaled 34,170 units as against 3268 in the same month a year ago. The corporation's first output in the first ten months of the current year amounted to 420,766 units compared with 177,671 units in the corresponding period of 1932.

Ford has blown in a blast furnace and started four open-hearth furnaces at its Rouge plant. It is understood that for the present it will make both alloy and plain carbon steel. The Ford steel works can furnish all of the company's needs for springs, wide flats for the side rails and cross members of the frames,

rear axles and housings, wire for wheel spokes and drive shafts. The reopening of the plant which has been shut down more than a year is attributed directly to the sharp rise in steel prices which once again makes its operation profitable.

On Wednesday of this week in Chicago will be demonstrated a new type of rail car to be operated on branch railroad lines. The unit consists of a standard automobile chassis with railroad axles on which is mounted a bus-type body. The unit can be run with or without a trailer according to the volume of traffic. Equipped with a gasoline engine the unit is equivalent to a large motor car mounted on rubber tired railroad wheels and is said to make possible economies never before attained in railroad transportation. It has been designed through the joint efforts of the Chrysler Corp., Fairbanks Morse & Co., Goodyear Tire & Rubber Co. and the Fruehauf Trailer Co.

Trade Notes

Superheater Co., New York, has appointed Walter N. Cargill, 185 Devonshire Street, Boston, sales agent in New England for stationary superheaters, economizers and other steam plant equipment.

Toledo General Mfg. Co., Toledo, Ohio, manufacturer of Demco line of standard and automatic sensitive drilling machines, has appointed Wilson & Brown, Inc., 30 Church Street, New York, as representative.

Kron Co., Bridgeport, Conn., maker of industrial scales, has appointed the following distributors: D. W. Lawler, 1911 Rutherford Avenue, Louisville, Ky.; L. G. Hardin, Alexandria, La., and W. B. McCauley, 15 West Franklin Street, Baltimore.

Combustion Engineering Co., Inc., New York, has made James Cleary manager of the Philadelphia sales district, with headquarters at 1616 Walnut Street. Fred L. Farrell has been appointed manager of the New England sales territory, with offices in the Chamber of Commerce Building, Boston. G. O. French, previously New York district sales manager of the Air Preheater Corp., has been made sales engineer, specializing in fire-tube boilers and special shop work.

Alloy Products Corp., Waukesha, Wis., has appointed the following representatives: H. P. MacGregor, 1314 Railway Exchange Building, St. Louis, for Missouri, northern Illinois and southern Kansas; W. F. Norton, 5606 Euclid Avenue, Cleveland, for northern Ohio and western New York, and E. W. Buschman, 626 Broadway, Cincinnati, for southern Ohio, Kentucky, and parts of Indiana, Virginia and Tennessee.

Ohio Electric Mfg. Co., Cleveland, has appointed W. S. Gains, 416 Lafayette Building, Buffalo, and E. A. Thornwell, 217 Whitehall Street, Atlanta, Ga., district representatives of the magnet department.

Devine, Tex., plans municipal steel pipe gas line distribution system. Cost about \$40,000. Financing is being arranged.

Universal Bearing Metals Corp., 258 State Street, Rochester, N. Y., has changed its name to Beryum Metals Corp.

R. F. C. Cuts Interest on Railroad Loans for a Year

WASHINGTON, Nov. 14.—In order that they may make extra purchases of supplies and employ additional men during the winter and succeeding months, Chairman Jesse H. Jones yesterday announced that the board of directors of the Reconstruction Finance Corporation has reduced the interest rates on loans to railroads, including both new and existing loans, from 5 per cent to 4 per cent for a period of one year from Nov. 1, 1933.

The Board took this action upon requests for a reduction in interest rates from a number of railroad executives who have offered to use the amount of such, together with substantial additional funds, in making extraordinary expenditures during the next six months. Chairman Jones pointed out that this would mean expenditures for labor, equipment and material over and over the railroad budgets for this period or in excess of the program presently contemplated by them, the purpose being to promote the President's recovery program. He added that the directors of the RFC have taken this action with the expectation that the savings in interest will be availed of and used by the railroads for the purposes indicated, together with very substantial additional amounts to be otherwise provided and expended by the railroads in relief employment.

Outstanding RFC loans to railroads total \$330,154,513. Reduction of 1 per cent in year for a year would therefore be \$3,301,545, which is to be expended for equipment and labor. The largest outstanding loan is \$69,552,378, made to the Baltimore & Ohio,

whose interest saving for the year would be \$695,523. The next largest loan is \$34,434,133 made to the Chicago & North Western, whose interest saving for the year would be \$344,341.

Most of the RFC loans made were for the purpose of enabling carriers to meet fixed charges. An outstanding exception was a work loan of \$27,500,000 made to the Pennsylvania and now repaid. The work loans now are made through the PWA for the purpose of purchasing equipment and employing labor. The PWA interest rate is 4 per cent after the first year, the same as the new rate of the RFC. For the first year the PWA loans carry no interest. They also are made upon equipment trust notes whereas RFC loans were secured by collateral such as bonds. The latter also run only for three years while PWA loans run for the useful life of equipment to be purchased. The PWA loans, again unlike RFC loans, do not subject railroad executives to reductions in salaries. These reductions in salaries, however, have already been completed.

Scrap Institute Will Convene in January

THE sixth annual convention of the Institute of Scrap Iron & Steel will be held on Tuesday, Wednesday and Thursday, Jan. 16, 17 and 18, at the Ambassador Hotel, Atlantic City, it has been announced today by Barney Rubine, chairman of the convention committee. The board of directors of the Institute, at its last meeting,

unanimously voted to accept the invitation of the New Jersey Chapter, to hold the annual convention in Atlantic City.

It is expected that the convention will be the most important in the history of the Institute, in view of the fact that the adoption of a code for the scrap iron industry may involve a reorganization of the Institute, to conform to the new obligations and duties imposed by the National Industrial Recovery Act. A new set of officers and directors will also be elected at this convention; the Chicago Convention held last July decided to hold over all the officers until the adoption of a code.

Mr. Rubine announced the following convention committee of the New Jersey Chapter, in addition to himself as chairman: Richard Bonomo, Arthur Reichmann, Abraham Isaac, Frank Contey, M. V. Bonomo, Meyer Lowenstein, Louis Schiavone and James J. Brady. Other names will be added to this committee to represent the various chapters of the Institute.

Scrap Exports Rise Sharply During 1933

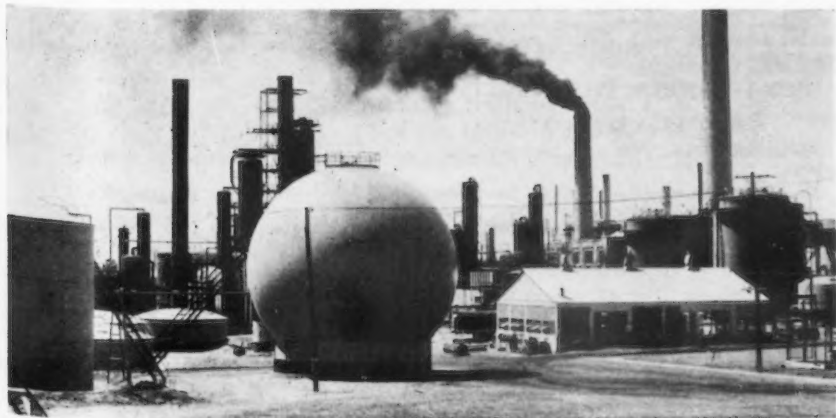
EXPORTS of scrap during the 1933 period totaled 513,587 gross tons as against 158,152 tons in the first nine months of 1932. In both periods Japan was the outstanding foreign buyer of this material, taking 389,332 tons in 1933 as compared with 128,902 tons in 1932.

A feature of the current year's export trade in scrap has been the increased purchases by European producers. Italy, the largest European scrap buyer took 52,100 tons in the nine-month period of the current year as compared to only 508 tons in 1932. Germany, the second largest buyer in Europe, increased its 1932 purchases of only 62 tons to 22,917. Poland, which took no scrap from the United States during the first three-quarters of 1932, bought 21,332 tons during the first nine months of 1933. The total value of scrap exported during the 1933 period was approximately \$7,600,000.

Developments that have brought trans-Atlantic air service closer to reality than generally supposed will be outlined at a meeting of the Metropolitan section of the Society of Automotive Engineers, to be held Nov. 16 at the Roger Smith Hotel, 40 East Forty-first Street, New York. Topics will include engine requirements. Clarence D. Chamberlin will be chairman.

Robert S. Hale, consultant on welding of steel structures, has moved his office to 1432 West Lake Street, Chicago.

THE results of a century of progress in tank construction. In the left foreground are two arc welded storage tanks; in the center is the most recent of all developments in tank construction—the Hortonsphere. This tank was built for the Empire Refining Co., Ponca City, Okla., by the Chicago Bridge & Iron Works. It is completely arc welded by the shielded arc process using equipment manufactured by The Lincoln Electric Co., Cleveland.



Fabricated Structural Steel

Awards Large—New Projects Decline

LETTINGS of 35,825 tons are the heaviest since the first week in May and the third largest for any corresponding period this year. Among outstanding bookings are 9000 tons for approach spans for the Golden Gate bridge at San Francisco, 8000 tons for the West Side elevated highway in New York, 5000 tons for a dam at Canton, Mo., and 3000 tons for a mill building at Kingsport, Tenn., for the Tennessee-Eastman Corp. New projects of 15,100 tons compare with 26,900 tons last week and 11,230 tons two weeks ago. The only sizable new job reported is 1700 tons for bracings for the Golden Gate bridge. Coast Guard cutters and a lighthouse tender for the Government will require more than 8000 tons of plates. Structural steel lettings for the week follow:

NORTH ATLANTIC STATES

Ellsworth, Me., 415 tons, State bridge, to Lackawanna Steel Construction Co.

Woolwich, Me., 455 tons, bridge, to Lackawanna Steel Construction Corp.

West Hennifer, N. H., 150 tons, State highway bridge, to Lackawanna Steel Construction Corp.

Gardner, Mass., 160 tons, warehouse for Haywood-Wakefield Co., to Berlin Construction Co., East Berlin, Conn.

New Britain, Conn., 300 tons, mill building for Stanley Works, to Berlin Construction Co.

Waterbury, Conn., 200 tons, fertilizer plant for Apothecaries Hall Co., to Berlin Construction Co.

Coscob, Conn., 200 tons, power plant, to Berlin Construction Co., Inc.

New York, 8000 tons, Manhattan West Side Elevated Highway, to Harris Structural Steel Co.

Brooklyn, 800 tons, Kings Brewery, to Berkshire Iron Works.

Nassau County, N. Y., 145 tons, bridge, to National Bridge Works.

Allegheny County, N. Y., 380 tons, bridges, to Lackawanna Steel Construction Corp.

Erie Railroad, 190 tons, grade crossing elimination at Elmira, N. Y., to American Bridge Co.

Davenport Center, N. Y., 325 tons, State highway bridge, to American Bridge Co.

Richmond Hill, N. Y., 190 tons, State highway bridge, to National Bridge Works.

Taylor, Pa., 325 tons, State Highway bridge, to McClintic-Marshall Corp.

Plymouth Meeting, Pa., 160 tons, mill building, to Norris Iron & Wire Works.

State of Pennsylvania, 325 tons, highway bridges in Lackawanna County, to McClintic-Marshall Corp.

State of Pennsylvania, 100 tons, highway beam spans in York County, to McClintic-Marshall Corp.

SOUTH AND SOUTHWEST

Berkeley County, W. Va., 110 tons, bridge, to Wheeling Structural Steel Co.

Kingsport, Tenn., 3000 tons, mill buildings for Tennessee-Eastman Corp., to Virginia Bridge & Iron Co.

Mobile, Ala., 110 tons, lighthouse depot buildings, to Jones & Laughlin Steel Corp.

Columbia, S. C., 500 tons, municipal stadium, to Virginia Bridge & Iron Co.

Carrollton, Ga., 170 tons, State highway bridge, to Austin Brothers Bridge Co., Atlanta.

Lake Okeechobee, Fla., 1150 tons, hurricane gates for United States Engineer Corps, to Virginia Bridge & Iron Co.

St. Petersburg, Fla., 200 tons, seaplane hangar, to an unnamed fabricator.

Harvey, La., 185 tons, buildings, to Jones & Laughlin Steel Corp.

State of Louisiana, 115 tons, bridge, to Vincennes Bridge Co.

Cotton County, Okla., 431 tons, highway bridge to Pittsburgh-Des Moines Steel Co.

State of Oklahoma, 440 tons, highway bridges, to J. B. Klein Iron & Foundry Co.

Woodward County, Okla., 160 tons, State highway bridge, to Kansas City Structural Steel Co.

CENTRAL STATES

Wrightstown, Wis., 580 tons, bridge, to Worden-Allen Co.

Pittsville, Wis., 150 tons, State highway bridge, to Worden-Allen Co.

Port Washington, Wis., 1000 tons sheet piling for breakwater; 800 tons to Inland Steel Co. and 200 tons to Bethlehem Steel Co.

Walker, Minn., 115 tons, bridge, to American Bridge Co.

Echo, Minn., 125 tons, bridge, to American Bridge Co.

Muscatine, Iowa, 2600 tons, sheet piling, locks for Government dam, to Inland Steel Co.

State of Missouri, 270 tons, highway bridges, to St. Joseph Structural Steel Co.

Canton, Mo., 5000 tons, dam across Mississippi River, to American Bridge Co.

Canton, Mo., 1800 tons sheet piling, to an unnamed bidder.

Homer, Nebr., 175 tons, bridge, to Omaha Bridge Works.

WESTERN STATES

Miles City, Mont., 190 tons additional, bridge, to Minneapolis-Moline Power & Implement Co.

Custer County, Ida., 116 tons, Bureau of Public Roads, bridge, to Virginia Bridge & Iron Co.

Kern County, Cal., 161 tons, State overcrossing at Oil Junction, to Minneapolis-Moline Power Implement Co.

Spokane, Wash., 200 tons, Felts Field hangar, to Isaacson Iron Works.

San Diego, Cal., 163 tons, building extension at Navy Yard, to Kyle Steel Construction Co.

Seattle, 200 tons, ship for Northland Transportation Co., to Berg Shipbuilding Co.

San Francisco, 9000 tons, approach spans on Golden Gate bridge, contract No. 4, to Columbia Steel Co., which will let part to Judson-Pacific Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Springfield, Mass., 350 tons, technical high school.

Newark, N. Y., unstated tonnage, New York Central Railroad crossing elimination. Plans to be submitted by Feb. 1; total cost about \$190,000.

Shandakin, N. Y., 200 tons, State highway bridge.

Fort Mifflin, Pa., 200 tons, Navy ammunition depot.

State of Pennsylvania, 2000 tons, highway bridge over Allegheny River at Parker City.

Washington, 190 tons, New Hampshire Avenue viaduct.

Washington, 900 tons, nine Coast Guard cutters for West coast; bids Nov. 28.

Washington, 225 tons, four Coast Guard tugs for West coast; bids under advisement.

SOUTH AND SOUTHWEST

Norfolk, Va., 860 tons, State highway bridge over East branch Elizabeth River.

Quantico, Va., 600 tons, three Government hangars.

Biloxi, Miss., 150 tons, seaplane hangar for United States Coast Guards; bids opened Nov. 10.

Sand Lake, Tex., 425 tons, bridge.

Millsap, Tex., 400 tons, bridge.

Little Rock, Ark., 400 tons, bridge for Missouri Pacific Railroad.

Lordsburg, N. M., 100 tons, undercrossing for Southern Pacific Railroad; bids under advisement.

Carlsbad, N. M., 625 tons, potash refinery and power house.

CENTRAL STATES

Chillicothe, Ohio, 150 tons, reformatory shop buildings.

Collinsville, Ill., 160 tons, State highway bridge.

Cleveland, 500 tons, building for Crystal Springs Brewing Co.

Onalaska, Wis., 600 tons, Mississippi River Lock No. 7; Nolan Brothers, Minneapolis, low bidder on general contract.

Chicago Department of Public Works, 265 tons of sheet piling; bids Nov. 17.

Muscatine, Iowa, 350 tons, locks for Government dam.

Kansas City, Mo., 6000 tons, Municipal Auditorium, Boaz-Kiel Construction Co., St. Louis, and Boyle-Prior Construction Co., Kansas City, low bidders.

Quincy, Ill., 800 tons, locks for Government dam; bids opened Nov. 14.

State of Missouri, 236 tons; highway bridges in Morris County, 123 tons, Lafayette County, 113 tons.

Sunset Hill, Ill., 154 tons, bids opened Nov. 9.

State of Nebraska, 2800 tons, bridges.

WESTERN STATES

Boulder Dam, 1200 tons, trash gates, Ingalls Iron Works, low bidder.

San Francisco, 1700 tons, bracing for Golden Gate bridge.

Mare Island, Cal., 300 tons additional, causeway at Navy Yard; bids Dec. 12.

Ventura County, Cal., 800 tons sheet piling, State seawall near Palm Beach.

Dillard, Ore., 300 tons, State highway bridge.

FABRICATED PLATE

AWARDS

Memphis, Tenn., 1035 tons, dredge pontoons and pipe, to Midland Barge Co.

Chicago, 182 tons, tanks for Hoerber Brewing Co., to Graver Tank & Mfg. Co.

Manitowoc, Wis., 800 tons, three Coast Guard cutters, to Manitowoc Shipbuilding Co.

Seattle, 625 tons, ship for Northland Transportation Co., to Berg Shipbuilding Co.

NEW PROJECTS

Washington, 1000 tons, two lighthouse tenders.

Washington, 6000 tons, nine Coast Guard cutters for West coast; bids Nov. 28.

Washington, 600 tons, four Coast Guard tugs for West coast; bids under advisement.

Washington, 450 tons, three Coast Guard ships for West Coast; Lake Union Drydock & Machinery Works, low bidder.

Puget Sound, Wash., 100 tons, material for Navy yard; bids under advisement.

SUMMARY OF THIS WEEK'S BUSINESS

Steel Production Sustained by Moderate Pick-up in Orders

Releases of Automobile Steel, Export Tonnage and Public Works Awards Halt Decline in Operations—Pennsylvania Railroad Tests Code

STEEL production has apparently struck at least a temporary resistance level. Public works awards are heavier, automotive steel requirements have improved moderately, and export business has picked up, especially in tin plate, but the combined gains have not been sufficiently large to foreshadow a material increase in mill operations.

While the scheduled rate of ingot output at the beginning of this week was 27.1 per cent of capacity, as compared with 25.2 per cent a week previous, reports of current operations assembled by THE IRON AGE reflect no perceptible change in production, present engagement at 26 per cent of capacity being identical with this publication's estimate for last week. In the Valleys the ingot rate has risen five points to 30 per cent and at Buffalo it has advanced three points to 24 per cent, but there have been declines of two points to 27 per cent at Chicago, one point to 17 per cent in eastern Pennsylvania and seven points to 25 per cent in the South. The Pittsburgh, Wheeling and Cleveland rates remain unchanged at 21, 38 and 40 per cent respectively.

RELEASES of full-finished sheets for Chevrolet bodies have helped sustain operations at Lake Erie mills and in the Valleys. However, the automobile industry will not get into volume production on new models until late in December and is not expected to buy additional steel in quantity before January or February. Similarly impending orders from the railroads for rails and rolling stock are not likely to affect steel output materially during the remaining weeks of this year.

Steel releases from miscellaneous consumers are holding up fairly well, although adversely affected by seasonal influences in some instances. A large export order for delivery prior to Jan. 1 will enable a leading producer of tin plate to continue capacity operations through the rest of the year.

PUBLIC works awards have taken a real spurt. Structural steel lettings, at 35,825 tons, are the largest since the first week in May and the third

largest for this year. Among outstanding awards are 9000 tons for approach spans for the Golden Gate bridge at San Francisco, 8000 tons for the West Side elevated highway, New York, and 5000 tons for a dam at Canton, Mo. While most of the tonnage placed during the week was for public projects, a notable exception was 3000 tons awarded for a mill building of the Tennessee-Eastman Corp. at Kingsport, Tenn.

Lettings of sheet steel piling total 3000 tons and plate awards 2600 tons. Chicago is in the market for 2945 tons of cast iron pipe. San Francisco has approved a bond issue for water main extensions requiring 18,000 tons of steel plates and 30,000 tons of cast iron pipe.

NO action has yet been taken on large-scale railroad purchases except by the Pennsylvania, which has asked for bids on 159,000 tons of steel on Nov. 23. Included are 100,000 tons of 112 to 152-lb. rails, 31,000 tons of tie plates, 3500 tons of spikes, 6800 tons of joint bars, 600 tons of steel wheels, and 4500 tons of plates, shapes, bars and sheets. Deliveries are wanted throughout the entire year 1934. The steel code bars deliveries beyond a given calendar quarter and, while it is probable that this provision will be amended so far as rails and track supplies are concerned, there is a serious question as to whether such a change will be made with reference to other materials. The Pennsylvania's inquiry for plates, shapes, bars and sheets is evidently intended as a test of the code.

ADVANCES in pig iron prices for first quarter are regarded as a possibility in view of increased costs. No changes in steel prices are looked for except on tin plate.

Scrap is dull and weak, although devoid of major changes in prices. THE IRON AGE scrap composite is unaltered at \$10 a gross ton. The pig iron and finished steel composites are also unchanged at \$16.61 a ton and 2.015c. a lb. respectively.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Nov. 14, 1933	Nov. 8, 1933	Oct. 17, 1933	Nov. 15, 1932
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia.....	\$18.26	\$18.26	\$18.26	\$13.59
No. 2, Valley furnace.....	17.50	17.50	17.50	14.50
No. 2 Southern, Cin'ti.....	18.13	18.13	18.13	13.82
No. 2, Birmingham.....	13.50	13.50	13.50	11.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	15.50
Basic, del'd eastern Pa.....	17.76	17.76	17.76	13.50
Basic, Valley furnace.....	17.00	17.00	17.00	13.50
Valley Bessemer, del'd P'gh..	19.76	19.76	19.76	16.89
Malleable, Chicago*.....	17.50	17.50	17.50	15.50
Malleable, Valley.....	17.50	17.50	17.50	14.50
L. S. charcoal, Chicago.....	23.54	23.54	23.54	23.17
Ferromanganese, seab'd car- lots.....	82.00	82.00	82.00	68.00

*The average switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Finished Steel

	Nov. 14, 1933	Nov. 8, 1933	Oct. 17, 1933	Nov. 15, 1932
<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.25	2.25	2.25	2.10
Hot-rolled annealed sheets, No. 24, Chicago dist. mill..	2.35	2.35	2.35	2.20
Sheets, galv., No. 24, P'gh..	2.85	2.85	2.85	2.85
Sheets, galv., No. 24, Chicago dist. mill.....	2.95	2.95	2.95	2.95
Hot-rolled sheets, No. 10, P'gh	1.75	1.75	1.75	1.55
Hot-rolled sheets, No. 10, Chi- cago dist. mill.....	1.85	1.85	1.85	1.65
Wire nails, Pittsburgh.....	2.10	2.10	2.10	1.95
Wire nails, Chicago dist. mill.	2.15	2.15	2.15	2.00
Plain wire, Pittsburgh.....	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill.	2.15	2.15	2.15	2.25
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill.....	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh..	\$4.65	\$4.65	\$4.65	\$4.75

Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$40.00	\$40.00
Light rails at mill.....	32.00	32.00	32.00	30.00
Rerolling billets, Pittsburgh..	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh....	31.00	31.00	31.00	31.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.60	1.60	1.60	1.60

Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh....	\$11.50	\$11.50	\$11.75	\$9.25
Heavy melting steel, Phila....	9.75	9.75	10.25	7.25
Heavy melting steel, Ch'go....	8.75	8.75	9.62 1/2	5.87 1/2
Carwheels, Chicago.....	9.00	9.50	10.00	7.00
Carwheels, Philadelphia.....	10.75	10.75	11.75	9.25
No. 1 cast, Pittsburgh.....	11.25	11.25	11.75	9.50
No. 1 cast, Philadelphia.....	11.25	11.25	11.50	9.25
No. 1 cast, Ch'go (net ton)...	8.50	8.50	10.00	6.25
No. 1 RR. wrot., Phila.....	11.00	11.00	11.00	7.50
No. 1 RR. wrot., Ch'go (net)..	7.25	7.25	8.50	4.50

Finished Steel

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.75	1.75	1.75	1.60
Bars, Chicago.....	1.80	1.80	1.80	1.70
Bars, Cleveland.....	1.80	1.80	1.80	1.65
Bars, New York.....	2.08	2.08	2.08	1.95
Tank plates, Pittsburgh.....	1.70	1.70	1.70	1.60
Tank plates, Chicago.....	1.75	1.75	1.75	1.70
Tank plates, New York.....	1.98	1.98	1.98	1.898
Structural shapes, Pittsburgh..	1.70	1.70	1.70	1.60
Structural shapes, Chicago....	1.75	1.75	1.75	1.70
Structural shapes, New York..	1.95 1/4	1.95 1/4	1.95 1/4	1.86775
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	1.70
Hot-rolled strips, Pittsburgh..	1.75	1.75	1.75	1.45
Cold-rolled strips, Pittsburgh..	2.40	2.40	2.40	2.00

Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$3.75	\$3.75	\$3.75	\$1.75
Foundry coke, prompt.....	4.25	4.25	4.25	2.75

Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Electrolytic copper, refinery...	8.00	8.00	7.50	5.25
Lake copper, New York.....	8.25	8.00	8.00	5.50
Tin (Straits), New York.....	55.20	51.37 1/2	46.75	24.05
Zinc, East St. Louis.....	4.50	4.50	4.75	3.15
Zinc, New York.....	4.85	4.85	5.12	3.52
Lead, St. Louis.....	4.15	4.15	4.10	3.00
Lead, New York.....	4.30	4.30	4.25	3.15
Antimony (Asiatic), N. Y....	7.20	6.70	6.87 1/2	5.87 1/2

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

Nov. 14, 1933	2.015c. a Lb.
One week ago	2.015c.
One month ago	2.036c.
One year ago	1.948c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	HIGH	LOW
1933	2.036c., Oct. 3	1.867c., Apr. 18
1932	1.977c., Oct. 4	1.926c., Feb. 2
1931	2.037c., Jan. 13	1.945c., Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29
1928	2.286c., Dec. 11	2.217c., July 17
1927	2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$16.61 a Gross Ton
16.61
16.61
13.59

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
1933	\$16.71, Aug. 29	\$13.56, Jan. 3
1932	14.81, Jan. 5	13.56, Dec. 6
1931	15.90, Jan. 6	14.79, Dec. 15
1930	18.21, Jan. 7	15.90, Dec. 16
1929	18.71, May 14	18.21, Dec. 17
1928	18.59, Nov. 27	17.04, July 24
1927	19.71, Jan. 4	17.54, Nov. 1

Steel Scrap

\$10.00 a Gross Ton
10.00
10.54
7.46

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1933	\$12.25, Aug. 8	\$6.75, Jan. 3
1932	8.50, Jan. 12	6.42, July 5
1931	11.33, Jan. 6	8.50, Dec. 29
1930	15.00, Feb. 18	11.25, Dec. 9
1929	17.58, Jan. 29	14.08, Dec. 3
1928	16.50, Dec. 31	13.08, July 2
1927	15.25, Jan. 11	13.08, Nov. 22

Decline in Production Halted at Pittsburgh



And Valley Rate Shows Recovery of Five Points—Large Export Order for Tin Plate Is Feature of Otherwise Drab Market

PITTSBURGH, Nov. 14.—An irregular flow of new business and specifications for finished steel products has resulted in intermittent rolling schedules in practically all operating departments. Aggregate tonnage, however, has not fallen off to the point where further scaling down of operations is necessary and ingot output in the Pittsburgh district is unchanged this week at 21 per cent of capacity. In the Valleys and nearby northern Ohio production has been stepped up this week to 30 per cent as a result of a spurt in specifications in that area. Eight additional open-hearths and one blast furnace were put on at the beginning of the current week. Operations in the Wheeling district are holding their own at 38 per cent.

Sheet mills and strip mills in the Pittsburgh district continue to suffer from the absence of demand from the automotive industry. The former group has reduced its output to about 25 per cent of capacity, while the latter group has revised rolling schedules to around 30 to 35 per cent. Sheet and strip demand from miscellaneous consuming lines continues to be insignificant.

Although a long-awaited slackening in tin plate specifications has finally appeared, most tin plate producers expect no interruption to full engagement before the turn of the year. A local tin plate mill will be heavily occupied during the greater part of December on a recent large export order for delivery before Jan. 1.

Filing of first quarter steel prices is expected on Nov. 20, with establishment of the new schedules to become effective Dec. 1. Although higher producing costs provide a definite basis for higher steel prices for the coming quarter, the current dearth of demand may influence producers to defer a move for higher quotations for the time being. Many revised extras on sheets and minor changes in extras on tin plate and other products are expected to be filed for consideration in connection with first quarter prices.

Steel rail, track accessory and equipment purchases by the railroads continue to be the focal point of the

immediate outlook for steel and some early releases of rail tonnage are promised by the recent appearance of several large rail inquiries. Primary materials markets are extremely dull. Recent declines in scrap prices appear to have been halted but values continue largely nominal.

Pig Iron

The complexion of this market still is drab. Shipments thus far in November are not proceeding so rapidly as in the early part of October. Bookings have also declined. Despite further talk of higher prices for next quarter, neither foundry nor basic consumers apparently see any reason to enter the market at this time. No specific developments in connection with first quarter quotations are reported. Unless a background of business appears, a move for higher prices in the coming quarter will probably be shelved for the time being.

Semi-Finished Steel

Sheet bars continue to be the prominent item in this group, although deliveries to tin plate mills are perceptibly slower. Billets and slabs are in slight demand, as are forging billets. Wire rods are sluggish. Quotations continue applicable to Dec. 31.

Nuts, Bolts and Rivets

With practically all important buyers having covered amply prior to price advances on Nov. 1, current buying is extremely light. The only pending tonnage of importance is 2000 tons of tunnel bolts, nuts and washers for the Midtown tunnel at New York. Only two bids were submitted on that tonnage, a Pittsburgh bidder having furnished the lower proposal. The railroad purchasing program augurs an early improvement in demand for these products.

Bars

With most consumers covered through December, new buying continues on a very restricted basis. Practically no support is coming from the automotive industry, nor is demand from that source expected to pick up until late next month. Prospective railroad purchases, it is hoped,

will eventually open up a fairly sizable demand for bars, but immediate benefit from the carriers' program is not expected. First quarter prices will probably be announced on Dec. 1. Although higher quotations for that period have been under consideration, there is little evidence at the moment that the present base of 1.75c., Pittsburgh, will be changed. Most of the fourth quarter tonnage was booked prior to the establishment of the present price, and little benefit to producers has thus far accrued from the advance.

Fresh demand for reinforcing bars is light. Aggregate pending tonnage for State work and railroad grade crossing elimination is fairly heavy, and early lettings of several outstanding projects are in prospect. No change in the current distributors' price of 1.80c., Pittsburgh, for billet steel reinforcing bars in stock lengths is considered likely for first quarter.

Plates and Shapes

About 1150 tons of fabricated plate for 48 steel pontoons for the United States Engineer's Office at Memphis will be furnished by a mill in this district. The Pennsylvania Railroad will open bids Nov. 23 on 4500 tons of plates and shapes for delivery at its Altoona, Pa., shops. Otherwise, the plate market is devoid of feature. Tank work continues to lag, and railroad repair work is adding very little to the current aggregate demand.

Structural awards during the past week increased in number. Small State highway bridges, however, continue to make up the bulk of PWA releases. Private work is slightly improved, with one award recorded for 3000 tons for mill buildings at Kingsport, Tenn. Fresh structural projects that appeared during the week were generally of a minor character.

Rails and Track Accessories

The Pennsylvania Railroad will open bids on Nov. 23 on 100,000 tons of steel rails, ranging from 100-lb. to 152-lb. sections for mutually agreed upon delivery; 250 tons of open-hearth steel girder rails, 159-lb. and 174-lb. sections; 6800 tons of joint bars; 31,000 tons of tie plates; 3500 tons of track spikes; 600 tons of steel car wheels, and 500,000 bond wires. Orders for the track accessories are expected to be placed so that final delivery will be made prior to Dec. 31, 1934. Inquiries for rails and companion fastenings are drifting in also from other roads, and sizable placements with the various rail mills are expected within the next several weeks. Orders for accessories, however, will probably await some code revisions covering delivery.

Sheets

With the exception of sustained demand from refrigerator makers and electrical equipment manufacturers, interest in sheets is at low ebb. Sheet

mill operations have again receded, and this week do not average above 25 per cent of capacity. Although producing costs have mounted in recent months, further price advances are not considered likely for the coming quarter. Many changes from the original set-up of extras under the code have been and will be filed for consideration in connection with establishment of first quarter price schedules. Meanwhile current prices are not being tested in the absence of new buying.

Strip Steel

The persistent retreat of consuming demand has resulted in intermittent operating schedules at at least one strip mill in this district. Operations this week for the strip group will average probably not more than 30 to 35 per cent. Prospective buying for the remainder of the quarter is not expected to be significant. Miscellaneous calls from the radio, cash register and implement manufacturers are considered too infrequent to take up the slack occasioned by lagging demand from the automotive industry. No change from the current quotations of 1.75c. for hot-rolled, and 2.40c. for cold-rolled, Pittsburgh, is contemplated for first quarter.

Tin Plate

A recent large export order for delivery prior to Jan. 1 will enable a leading producer in this district to continue capacity operations through the year. Other producers have sufficient specifications against old contracts to carry them through November, after which hot rolling against next year's consumer needs will commence. With practically all cost factors in the production of tin plate reflecting markedly higher levels, there seems to be very little doubt that the 1934 price, which will probably be announced this month, will be sharply higher.

Tubular Products

Standard pipe and oil country tubular goods are the only active items in this group. The general outlook in consuming quarters dampens hopes for any pick-up for the remainder of the year. Boiler and mechanical tubing may be in better favor as soon as the railroads line up their equipment replacement programs. July price cards continue effective for the remainder of this year.

Wire Products

Wire mill operations continue a downward trend as a result of dwindling order books. Jobber demand is poor, and interest from agricultural areas is not conspicuous. Manufacturers' wire is practically marking time pending change-overs to new models by the motor car makers. A fair amount of wire mesh for State road work is still in the offing.

Coke and Coal

Although buying in this market is negligible, minimum prices both on coke and coal are holding by virtue of code dictates. Standard Connellsville furnace and foundry coke is becoming plentiful, but at \$3.75, ovens, for the former grade, and at \$4.25 for the latter grade, consumers are not interested. Premium brands for spot and contract shipment are quotable at \$5.25, ovens. More normal operations at commercial bituminous mines are resulting in a flood of offerings. Slack is particularly in evidence, and shippers are experiencing difficulty in avoiding accumulations. Practically 90 per cent of current shipments are against old low-priced contracts.

Scrap

The down trend in scrap prices has apparently been temporarily arrested. No. 1 heavy melting steel is unchanged at \$11.25 to \$11.75, with no sales reported during the past week. Practically all other grades are inactive. Turnings are particularly difficult to move and dealer offerings of this grade at prices below the current market have failed to attract buyers. Inquiry for specialties has improved. While specialties are not very plentiful, the available supply is considered wholly adequate to meet the somewhat restricted demand. Prices on couplers and knuckles, coil and leaf springs and rolled steel wheels are firm at present levels.

Reinforcing Steel

**Awards 855 Tons—New Projects
5850 Tons**

West Point, N. Y., 180 tons, barracks, to Carroll-McCreary Co., Inc.

Rockland and Sullivan Counties, N. Y., 250 tons, road mesh, to American Steel & Wire Co.

Kern County, Cal., 119 tons, State overhead-crossing at Oil Junction, to Pacific Coast Steel Corp.

Hamilton Field, Cal., 171 tons, officers' quarters, to Soule Steel Co.

Hamilton Field, 135 tons, non-commissioned officers' quarters, to Pacific Coast Steel Corp.

NEW REINFORCING BAR PROJECTS

Philadelphia, 900 tons, shipway at Philadelphia Navy Yards; bids Nov. 14.

Philadelphia, 700 tons, Juniata housing project; bids in.

Norfolk, Mass., 180 tons, three dormitories.

Lynn, Mass., 400 tons, bridge substructure.

Morris County, N. J., 350 tons; bids Nov. 27 at Trenton.

Onalaska, Wis., 350 tons, Mississippi River Lock No. 7; Nolan Brothers, Minneapolis, low bidder on general contract.

Kansas City, Mo., 2000 tons, municipal auditorium; Boaz-Kiel Construction Co., St. Louis, and Boyle-Prior Construction Co., Kansas City, low bidders.

Fort Knox, Ky., 700 tons, Government barracks; J. A. Holpuch Co., Chicago, general contractor.

Denver, 100 tons, material for Boulder Dam, Invit. No. 23,032-A, bids under advisement.

Hamilton Field, Cal., 700 tons additional, three hangars; bids under advisement.

Oakland, Cal., 400 tons, Standard Brands building; bids under advisement.

Los Angeles, 103 tons, State paving between Olive View and Tunnel Station; bids Nov. 29.

Los Angeles County, Cal., 151 tons, bridges at Cornwall and Lord Streets over Ramona Boulevard; bids soon.

Mare Island, Cal., 320 tons, causeway at Navy Yard; bids Dec. 12.

Fort Lewis, Wash., 350 tons, two barracks; general contract awarded.

Pearl Harbor, T. H., 300 tons, facilities building at Navy Yard, Specification No. 7074.

Canal Zone, 176 tons, material for Navy base, Specification No. 2914.

Through-Bolt Weighs 6 Tons

THE 13-in. diameter, 310-in. long, center through-bolt, here pictured in the process of machining, will help hold together the 60-in. diameter metal disks that compose the rotor for the Philadelphia Electric Company's new 250,000-hp. turbo-generator now being built by the Westinghouse Electric & Mfg. Co. at East Pittsburgh. It is a nickel-molybdenum steel forging and weighs approximately 6 tons.



Chicago Production Off Two Points to 27 Per Cent



But Downtrend Seems to Be Approaching a Resistance Level—Automotive Business Shows Signs of Improving—Scrap Weak

CHICAGO, Nov. 14.—Ingot output has dropped two points to 27 per cent of capacity, but it is evident that resistance to further recession is developing. Miscellaneous manufacturers are taking more steel and shipments to some automobile plants are gaining. The prospects for rail tonnages and the large attendance at furniture shows are encouraging factors.

The net result so far is that steel production is no longer sagging in all directions, the week having witnessed the addition of open-hearth furnaces to partly offset losses. Specifications for finished steel are moderately heavier, but new buying remains drab. Inquiries, bolstered by rails for which some tentative allotments have been agreed upon, are the heaviest in several months. Current lack of buying, in the view of sellers, is to be expected in view of the fact that first quarter business cannot be taken before Dec. 1.

The Studebaker plant at South Bend, Ind., is operating on a heavier schedule and Nash was stepping up output sharply until suddenly halted by a strike in its assembly department. Word from Kenosha indicates early settlement of the differences at the Nash plant.

The wire market is feeling the effects of better demand from miscellaneous manufacturers, and sellers are of the belief that jobbers must soon enter the market for replenishment of stocks.

Pig Iron

Shipments of Northern foundry iron are mounting. From all indications shipments will continue heavy up to the end of the year, when contracts are automatically terminated. As a whole, the melt is lower, but in western Michigan, where many automobile parts are made, the consumption of pig iron is moderately heavier. Increasing production by parts makers usually points the course that automobile builders will follow.

Reinforcing Bars

Weather, well below freezing, is effectively retarding demand in this market. Central Western States are awarding road and bridge work, but contractors will not need steel for

slabs before next spring and are in no hurry to place orders. Bridge work, usually carried forward in a modified way in winter, should be productive of orders in the near future. There still remains a sprinkling of small private jobs.

Cast Iron Pipe

Chicago will open bids Nov. 17 on 2345 tons of 12 and 16-in. pipe. Chicago still has pending 200 tons of 20-in. pipe and 400 tons of special castings. Details in connection with the Chicago Sanitary District's efforts to effect a Federal loan are being ironed out and the trade is hopeful that bids for the pipe needed will be taken before the end of the month.

Sheets

Output of hot mills has been dropping steadily and now stands at 25 per cent of capacity, where it gives indication of having reached bottom. New buying is very dull, but this may be explained by the nearness of the contracting period for the first quarter. Specifications are moderately heavier.

Sheet Steel Piling

Current purchases total close to 3000 tons, about 2000 tons of which is for a Canton, Mo., dam and 1000 tons for harbor work at Port Washington, Wis. Most projects now pending are related to lock, dam and gate work on the upper Mississippi River.

Wire Products

Demand is showing periodic strength, indicating that bottom may have been reached. This check to the downward drift of shipments, which are holding production close to 25 per cent of capacity, is the result of larger use of wire and wire products by small and miscellaneous manufacturers. The automobile trade is offering little help, but jobbers' stocks are known to be low and some added business is expected from that source. There is talk of higher prices for first quarter delivery. Some sellers are opposed to such a move, pointing out that present prices have not been given a real test.

Rails and Track Supplies

Western railroads are now making known their rail requirements, but so

far no tonnages actually have been placed. There is delay on the part of those Northern railroads which normally take water shipments in the late fall. It is now doubtful whether orders for Lake shipment will be placed because of the greater risks involved from mid-November to the time that ice locks the Straits. Based on inquiries that are now before the trade, the total volume of rails to be taken will closely approximate earlier estimates both as to the tonnage for the country as a whole and the 275,000 tons which are expected to be taken by Chicago mills.

Plates

Transactions are confined to a few miscellaneous tonnages, the largest of these being for the dam at Canton, Mo., and 800 tons for three Coast Guard cutters. Three oil barges and three lighthouse tenders will take 3000 tons, and plates will be needed for tanks for a potash refinery at Carlsbad, N. M.

Bars

Specifications for bar mill products are heavier by a sufficient margin to make the week the best since September. Spring makers are more active, but as yet little added business has come from automobile manufacturers.

The rail steel bar market remains quiet, but sellers are getting encouragement from reports of substantial buying at current furniture shows. Furniture manufacturers usually await the end of the shows and then compute sales as a basis for manufacturing schedules. This source of business should open up to mills in the next two or three weeks.

Structural Material

Awards total about 7000 tons and fresh inquiries call for 12,000 tons. The largest contract placed is for 5000 tons for a dam at Canton, Mo. Other awards are for the most part for highway bridges. About 1800 tons of structural steel will be used at Boulder Dam, and a potash refinery and a power house at Carlsbad, N. M., call for over 600 tons. This last project is outstanding in that it represents one of the few private undertakings that is now before the trade. Small tonnages for railroad bridge repairs are more numerous.

Scrap

Sales are lacking and prices on the whole are nominal. Steel mills are still restricting shipments and dealers, having only limited outlets for their purchases, are staying out of the market. A railroad has refused \$8.60 a ton, delivered, for heavy melting steel, and its attitude is shared by most producers, who would rather speculate on higher prices in the future than to let go of accumulations at the current market.

Steel Releases Are Light in New York District



Accumulated Consumer Stocks Bar Pick-Up in Demand — Tin Plate Exports Improve—Few Price Changes for Next Quarter Expected

NEW YORK, Nov. 14.—Except for public works projects and prospective rail and equipment business from the railroads, the outlook in the finished steel market is without promise. In most products buyers purchased so heavily prior to code price advances that they are well stocked for a considerable period ahead. It now develops that the railroads were no exception to the rule but accumulated sufficient material to keep their repair shops supplied well into the future. There is also some question as to whether all of the tin plate being taken by buyers is going directly into cans. Most users are taking shipments against contracts placed when the market was \$4.25 a base box, and have not been affected by the advance in the spot quotation to \$4.65. With production costs going up and tin prices soaring, a sharp advance in tin plate, possibly to \$5, will probably be made for 1934 deliveries. As a consequence buyers have every incentive to specify fully against this year's contracts. The decline of dollar exchange, although boosting the price of tin, has reduced the American price of tin plate in foreign markets, with the result that heavy export orders have been recently booked.

Outside of tin plate, specifications for finished steel have been lagging except in black plate, which has been in demand from toy manufacturers. However, most of the steel required for the toy trade has been delivered, since the finished products must be ready for distribution early in December.

An Eastern railroad has released 2300 tons of rails against an old contract. No action has yet been taken on proposed purchases of rails and track accessories with Government financial aid. Harris Structural Steel Co. has been awarded 8000 tons of steel for the Thirty-eighth Street to Forty-sixth Street section of the West Side elevated highway in New York. Bids have been received by the Port of New York Authority on 2000 tons of high-tensile bolts, nuts and washers for the lining of the new Midtown Hudson Tunnel, New York.

There is an unconfirmed report of an impending reduction of the present 30c. extra on less-than-carload shipments of wire nails. In general, however, no early price changes are

looked for. The prices which will be filed shortly for first quarter will probably include few, if any, advances over present quotations, tin plate excepted.

Pig Iron

As announcement of first quarter quotations impends, all consumers indicate additional hesitancy concerning new commitments. Sellers in this district expect no recovery in new bookings until permission is given to sell on the new price basis, supposedly on Dec. 1. The current market is wholly sustained by a quiet routine carload demand, mostly prompt, although a few bookings extend through December. Sales last week aggregated 2100 tons, against 2400 tons the week before, and 3000 tons booked a fortnight ago. Contract shipments again are generally moving out on schedule to jobbing foundries, and the volume of current releases presupposes a slight general recovery in melt. Conversion costs have mounted since furnaces established fourth quarter prices, and, despite some belief that the present market will not support an advance, an increase of as much as \$1 a ton would not be unexpected.

Reinforcing Steel

Quotations on rail and billet steel reinforcing bars are exceptionally firm despite the low volume of business and strenuous efforts of contractors to secure supplies at shaded levels. Awards last week totaled 600 tons of bars and mesh for construction at West Point, N. Y.; Medford, Mass., and Rockland and Sullivan Counties, N. Y. Road work in Rhode Island has declined considerably, and Connecticut is withholding projected work until additional Federal funds are received. Over 1000 tons of miscellaneous steel will be awarded in Albany on Nov. 21, and New Hampshire is expected to award a sizable tonnage on Dec. 10.

Scrap

With operations at about 20 per cent of capacity, Pittsburgh and eastern Pennsylvania mills are not expected to show additional interest in scrap supplies. With the exception of cast and heavy melting grades, prices in this buying district continue un-

tested and nominal at quoted levels. Cast grades for Phillipsburg, N. J., continue to be loaded at Jersey City, and recent sales for the Bridgeport, Conn., melter established buying prices in New York 25c. a ton lower at \$7 and \$6 for No. 1 machinery cast and No. 2 cast respectively. Bethlehem's canal shipments have ceased, but light loadings are being made for ocean shipment to Sparrows Point, Md. In addition, Bethlehem is quietly inquiring about cast grades to cover prospective requirements of the recently awarded tunnel segments. No abatement is apparent in export loadings, and weekly shipments from all parts approximate 13,000 tons. No. 1 and No. 2 heavy melting steel are being attracted from within 130 miles of Philadelphia for shipment from that point to Japan, Italy and Poland. Germany is suddenly showing considerable interest in purchases of nickel steels of various kinds.

Pig Iron Shipments Gain in South

BIRMINGHAM, Nov. 14.—Pig iron shipments are forging ahead of those for the first half of October, but there is practically no buying. Most foundries have contract iron pending and those that have not are buying in small lots as needs arise. The steady movement is attributable to low-price contracts, extended to the fourth quarter, which must be cleared up by the end of the year. It is thought that a substantial part of this is being stocked. Some foundries are taking a part of this low-price iron in November and the remainder in December, so not much of a recession in shipments is expected either this month or next month. The current price remains firm at \$13.50.

Tennessee Coal, Iron & Railroad Co. resumed production Nov. 9 at its Fairfield No. 6 blast furnace, banked since Oct. 16, and then banked its Fairfield No. 5 on Sunday. The total number of active furnaces in the South remains at six. Sloss-Sheffield and Republic each have two active stacks, while the Tennessee company and Woodward each have one.

The cast iron pipe market is still without much stimulation. Prospects looked somewhat better late last month, but it now appears that November will not be much ahead of October. A number of orders are in suspension, being for public works not yet completely approved.

Steel

Steel demand is low and current orders are small and scattered. Only six open-hearths were operated in the district last week, as compared with four to eight the preceding week and nine three weeks ago. This week there will also be six.

Operations Hold at 40 Per Cent in Cleveland Area



Releases for Chevrolet Body Work Help Sustain Mill Operations—Pig Iron Shipments Show Gain Over October

CLEVELAND, Nov. 14. — New business and specifications for finished steel are very light, and producers do not see much prospect of improvement until there is general buying by the automotive industry. As production of new automobile models has been delayed by the tool and die makers' strike in Michigan, steel producers are not hopeful of getting much more business from this source until well along in December.

Chevrolet has furnished the one bright spot in this industry for the steel makers, as it has issued releases for some of the full-finished sheets recently placed for the Fisher body plant in Cleveland and mills can produce this steel to start shipments about Dec. 1. The placing of this business has enabled some of the Ohio sheet mills to avoid sharp curtailments in operations. Ohio stamping plants are figuring on considerable automotive work, but little if any of this has been placed.

As the year is drawing to a close, producers and consumers are turning their attention to 1934. While renewed activity is not looked for this year in most industries, the feeling regarding the outlook for the early part of next year is fairly optimistic.

Ingot output which took a spurt in the Cleveland-Lorain territory to 40 per cent of capacity last week remains at that rate this week, and this rate probably will be maintained a week or two longer. While the increase is due largely to the desire to fill orders for sheet bars for water shipment to Michigan before the close of Lake navigation, some of this semi-finished steel demand resulted from the new Chevrolet orders for sheets.

Railroad orders for sheets and plates for repair work have improved. No rail buying is in prospect in this territory. Very little business is coming from general consuming industries.

Pig Iron

Shipments have improved and will show an increase in November over October. There is apparently no gain in melt. Better shipping orders are due to the ordering out of iron covered by old contracts, most of this business being taken before the code became effective and at \$1 to \$2 a ton below present prices. Consumers,

including automobile foundries, are stocking this iron and shipments are expected to show a further gain during the remainder of the year, as under a recent ruling of the Iron and Steel Institute producers are allowed to make shipments against these contracts until Dec. 31. Some inquiry for the first quarter has come out, although under the code producers cannot quote for that delivery until Dec. 1. Current orders are very light.

Iron Ore

The shipping season is rapidly coming to a close. Several shippers have dispatched their last cargoes and there will be only a few more scattering cargoes, the last one of which probably will not be moved until the latter part of the month. Shipments so far this month run slightly over 500,000 tons.

Bars, Plates and Shapes

Activities in the construction field are quite limited. A Cleveland brewery will require 500 tons of structural steel. The Erie Railroad has made another award for its Elmira, N. Y., grade crossing elimination work, the latter contract calling for 180 tons. The Pennsylvania Railroad will take bids tomorrow for a bridge in East Aurora, N. Y., requiring 800 tons of structural shapes and 155 tons of reinforcing bars. Awards of 3500 tons additional for the Cleveland sewage disposal plant are still pending. The Ohio highway department has issued a new list against which it will take bids Nov. 24. Plate makers still are getting quite a little tonnage for brewery tanks.

Sheets

The Fisher Body Corp'n. has issued some releases for full-finished sheets against the recent order it placed for making Chevrolet bodies in its Cleveland plant, and this tonnage is enabling a few of the Ohio mills to maintain or increase recent production. Others have further curtailed their rolling schedules. An improvement in orders from railroads for car repair work is reported. Demand from makers of consumers' products, such as refrigerators, stoves and washing machine tubs, has approached the vanishing point and little business from this source is expected until

new models are brought out around the first of the year. The steel barrel industry is keeping busy, but some of the barrel manufacturers have enough stock to last them the remainder of the year.

Strip Steel

In the absence of new business of any size from the automotive industry, demand for both hot and cold-rolled strip is very slack. Miscellaneous orders are not plentiful and are for small lots. Improvement is not expected until more general buying for new models is started by the automobile manufacturers.

Scrap

Consumer demand is still absent. Most consumers have good stocks, and little new demand is expected for delivery this year. Cleveland mills continue to receive considerable scrap by water from Detroit. Dealers have little material to ship to Valley district mills against old orders. While the market has a weak tone, prices are unchanged, but in the absence of sales are nominal.

Cincinnati Market Lacks Life

CINCINNATI, Nov. 14.—Further recession in foundry melt is reflected in a slowing up of pig iron shipments and a lack of appreciable new business. A few stove foundries are operating at a fair rate, but the peak of business in this line appears to be past unless improvement in other lines should provide new stimulus. Machine tool foundries are without substantial business, although a few are working on stock castings. Total purchases of pig iron during the week were about 300 tons, representing urgent requirements of melters. The market, however, has a sensitive appearance and any improvement in business conditions is sure to have an immediate response in an uptrend here. With inventories fairly substantial, consumers are not interested in future needs. The rumored possibility of price advances failed to have any stimulating effect upon the market.

Steel

Moderate improvement in miscellaneous sheet demand has increased mill bookings slightly to about 40 per cent of capacity. Uncertainties in the automotive trade are restricting sheet specifications, although mills look for an early improvement in business from that quarter. Prices are steady, although increases are expected on Dec. 1.

Fabricated steel is dull. Current sales are for small amounts and even these orders are infrequent. With bond issues for public construction defeated in the election, fabricators are

turning their attention toward proposed Federal housing projects as the most likely prospects.

Warehouse Business

While demand is not brisk, new business is being well sustained despite declines reported in other markets.

Scrap

The market continues to show weakness, dealers' bids having receded as much as 50c. on some items. New business is nil, mills refusing to consider new commitments as old ones run out. Material is available in fair quantity and is worth whatever can be obtained.

Light Trading in Pig Iron at Boston

BOSTON, Nov. 14.—Pig iron sales the past week amounted to but a few hundred tons, and there is no prospective business in sight at the moment. Furnace representatives, however, believe there will be some buying for first quarter delivery as soon as a price policy for that period has been established, which probably will be this week. On the other hand, they realize that the New England melt is not increasing perceptibly and that most likely it will decrease as soon as stove and textile machinery makers fill orders on their books, probably by the end of December.

The American Steel & Wire Co., Worcester, Mass., is still paying \$7 a ton, delivered, for No. 1 steel scrap and \$6 a ton for No. 2, the same as a week ago. That company's price of \$5.75 a ton, delivered, for bundled skeleton, however, is \$1 a ton lower than previously. The scrap market otherwise is exceptionally quiet and the undertone appears softer although no actual reductions in prices have been made.

St. Louis Expects Better Iron Demand in January

ST. LOUIS, Nov. 14.—Heavy buying of pig iron immediately after the turn of the year is expected by makers. One seller of many years' experience predicts that the movement will be the largest this market has seen for the last four or five years. One reason for this prediction is the extremely low level of stocks in the hands of melters, with the prospect of virtually no carryover into the next quarter. Buying has been conservative, even in anticipation of higher prices, because of the unwillingness of banks to finance pur-

chases of greater tonnages than were required for immediate needs. Shipments and sales fell off during the last week.

Business in finished steel has again shown a falling off. Purchasers of lighter products bought sufficient tonnages before the prices were advanced, and demand for plates and shapes is negligible. Two of the structural fabricating plants in the district are busy, but average operations in fabricating shops do not exceed 25 per cent of capacity. Boaz-Kiel Construction Co., St. Louis, and Boyle-Prior Construction Co., Kansas City, are low bidders on the Kansas City Municipal Auditorium requiring 6000 tons of structural steel and 2000 tons of reinforcing bars.

Railroad scrap lists are light, and those that are sold are going to other markets. The Missouri-Kansas-Texas Railroad sold 30 carloads for export through the port of Houston, Tex., and the Missouri Pacific sold 85 carloads to the Colorado mill. Two East Side melters entered the market for a few thousand tons of melting steel each. Prices are unchanged.

Slight Gain in Steel Output at Buffalo

BUFFALO, Nov. 14.—This week finds an additional open-hearth in operation at the Republic Steel Corp., making four in all. The Lackawanna plant of the Bethlehem Steel Corp. is operating three and Wickwire-Spencer two. The Seneca sheet division of Bethlehem is running at 40 per cent.

Pennsylvania Railroad grade crossing at East Aurora, N. Y., will require 850 tons of structural steel. A Buffalo fabricator is low bidder for 450 tons of structural steel for a highway bridge at Woolwich, Me. This concern has also taken one Allegheny County bridge of 135 tons and another of 240 tons.

The pig iron market is quiet, awaiting announcement of first quarter prices. Shipments are fair and there is an occasional spot purchase. General Electric is understood to have closed against its recent inquiry for 800 tons. On another large inquiry, mentioned some weeks ago, action has apparently been dropped.

The scrap market is practically stagnant. It is understood some small lots of No. 1 machinery cast have been sold at \$10.50 and some No. 1 cupola cast at \$10. Some small distress tonnages of No. 1 heavy melting steel are said to have been sold for lower than \$9, but it is probable that, if there is scrap buying in the event of railroad purchasing, No. 1 will command more than \$9.

Large Plate and Pipe Project on Coast

SAN FRANCISCO, Nov. 13.—At the polls San Francisco approved bonds in amount of \$17,595,000 for construction of extensions of water and high-pressure systems and for the raising of the O'Shaughnessy Dam. It is estimated that more than 18,000 tons of steel plates and 30,000 tons of cast iron pipe will be used in these projects.

The Great Lakes Construction Co. was low bidder on the Federal building at San Francisco at \$2,647,800. Approximately 4000 tons of structural steel and 600 tons of reinforcing bars will be required.

Inquiries reported during the week on cutters and tugs for the Coast Guard service increased new pending business to 2442 tons of structural steel and 7346 tons of plates. Reinforcing bars inquiries aggregated 2908 tons. Federal construction accounts for the larger share of new projects. Structural steel bookings for the week totaled 9959 tons, which included 9000 tons recently taken by Columbia Steel Co. for the Golden Gate bridge approach spans. Reinforcing bar awards were limited to 452 tons.

Cast Iron Pipe

Woodbourne Prison, Woodbourne, N. Y., will take bids until Nov. 21, for 126 tons of 2-in. pipe and larger, for water supply system.

Baltimore plans pipe lines in Pennington and Belvedere Avenues and other streets. Cost about \$90,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 24 for malleable and cast iron pipe fittings (Schedule 1098) for Eastern and Western yards.

North Pleasanton, Tex., plans water pipe line system. Cost about \$30,000. Federal loan is being arranged. A. A. Pierce, San Antonio, Tex., engineer.

Burr Oak, Mich., plans water pipe line system. Cost about \$30,000. Andrew Linderink, Kalamazoo, Mich., is engineer.

Cleveland has placed 4400 tons for water mains to United States Pipe & Foundry Co.

Chicago will take bids Nov. 17 on 2345 tons of 12 and 16-in.

Chicago has received low bid from Glamorgan Pipe & Foundry Co. for 229 tons of 20-in.

Kenosha, Wis., closes bids Nov. 18 on 8000 lin. ft. of 24-in. class B, with alternate bids on class 150, also for centrifugal material. H. C. Laughlin is city manager.

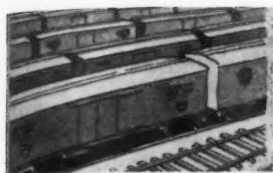
Steelville, Mo., plans water pipe line system. Cost \$41,341, including pumping machinery and elevated steel tank, etc. Financing is being arranged. J. W. Shikles & Co., 3212 Olive Street, Kansas City, Mo., are consulting engineers.

Lewiston, Wash., has awarded 200 tons to Pacific States Cast Iron Pipe Co.

Artesian Irrigation District 7, care J. C. Jones, R. F. D. 2, Walla Walla, Wash., plans 13,900 ft. of 2 to 6-in. Financing is being arranged. McKinley Jackson, Walla Walla, is engineer.

Morgan Hill, Cal., plans 29,450 ft. of 4 to 8-in. for water system. Fund of \$44,740 is being arranged, to include pumping equipment and accessories.

Railroad Inquiry Features Philadelphia Steel Market



Pennsylvania Is in Market for 159,000 Tons of Rails, Accessories and Rolled Steel—Ingot Production Recedes Further

PHILADELPHIA, Nov. 14.—With the Pennsylvania Railroad asking for bids until Nov. 23 on 159,000 tons of rails, track accessories, steel wheels, bars, plates, shapes and sheets and smaller inquiries before the trade from the Seaboard Air Line, the Western Maryland and the Atlantic Coast Line, the eastern Pennsylvania steel market is at last beginning to feel the effects of the long-deferred capital goods buying program sponsored at Washington. It is also significant that the only other important tonnage before the trade consists of light cruisers and coast guard cutters for the Navy Department, which call for 4000 tons and 3700 tons of steel respectively. Of more than usual interest is an inquiry from the Navy Department for 200 tons of stainless steel to be used at the Naval Gun Factory at Washington. This is one of the largest inquiries for stainless ever reported in this market.

While the Pennsylvania inquiry does not necessarily promise that as much as 159,000 tons of steel will be bought, it is believed that most of the products specified are badly needed and will eventually be taken out, even though the inquiry asks for delivery over all of 1934. As steel makers are forbidden by the iron and steel code to quote prices for more than four months in advance, or for more than one month ahead of a forthcoming quarter, the Pennsylvania's inquiry may require an amendment to the code. Plans to meet the situation are said to be under consideration. Bids are being taken on the following: 100,000 tons of rails, 300 tons of girder rails, 31,000 tons of tie plates, 6800 tons of joint bars, 3500 tons of spikes, 600 tons of rolled steel wheels and 4500 tons of bars, plates, shapes and sheets. The plates and shapes are for delivery at Altoona, Pa., and are not believed to be required for the car building program which the railroad is preparing to inaugurate. No inquiry has appeared for the steel required for these 7000 freight cars, at least 3000 of which are likely to be built in the company's shops. The first cars likely to get underway are 500 automobile box cars, for which inquiry for sheets and plates is expected momentarily. It is now reported that 1500 of the cars to be built will be flat cars, thus scaling down the original estimate of total steel requirements.

The Seaboard Air Line is in the

market for 3500 tons of tie plates, 1200 kegs of track bolts and 1365 kegs of spikes. The Western Maryland is inquiring for 2000 tons of rails, with accessories likely to follow. As mentioned last week, the Atlantic Coast Line plans to buy 2500 tons of tie plates.

Steel production in eastern Pennsylvania has fallen off another point to 17 per cent of capacity. Rolling schedules are intermittent at most plants.

Pig Iron

Buying is confined to carload lots and releases against old contracts are somewhat lighter. With the exception of two or three small inquiries from the Navy Department, the market is lacking in specific tonnages. The belief that prices will be advanced about Dec. 1 is still held in this market, and it is indicated that a fair amount of business would be driven in.

Sheets

Demand continues very light, and is confined principally to makers of stoves, radios and miscellaneous stampings. Automotive parts makers in this district are not yet showing any interest in their forward requirements.

Bars, Plates and Shapes

Bids will be taken Nov. 28 on 2800 tons of plates and 900 tons of shapes for nine coast guard cutters. A Wilmington, Del., shipbuilder is expected to place 900 tons of plates for three coast guard cutters which it was awarded some time ago. About 600 tons of plates and 225 tons of shapes and bars will be required for four tug boats for the Coast Guard Service on which bids are closing today. Definite inquiry for the steel for two cruisers to be built in the New York and Philadelphia Navy Yards has not appeared, although it is believed that about 4000 tons will be needed. Demand for structural steel continues light, although inquiry has appeared for 2000 tons for a bridge at Parker City, Pa., for the State Highway Department. Bids are being taken today on 900 tons of reinforcing bars for a shipway at the Philadelphia Navy Yard and contractors' bids have already been taken on the Juniata housing project which will take 700 tons of bars. Road jobs are being let reg-

ularly, but the miscellaneous steel tonnages required do not bulk large.

Scrap

No mill buying is reported, although a small tonnage of blast furnace scrap was sold into consumption at \$6. Dealers are paying no more than \$5.50 to cover against this order. One dealer has begun to load No. 1 heavy melting steel for export at a nearby dock and will move approximately 5000 tons. Prices on the steel making grades are unchanged.

Pipe Lines

Santa Maria Reservoir Co., Monte Vista, Colo., plans installation of about 8200 ft. steel pipe for water trunk line (wood stave pipe also under consideration). Fund of \$300,000 has been arranged for this and other expansion.

Skelly Oil Co., Tulsa, Okla., plans 6 and 8-in. welded steel pipe line from Cunningham oil field, Kingman County, Kan., to refinery at El Dorado, Kan., for crude oil. Right-of-way is being acquired.

San Diego, Cal., plans pipe line from El Capitan to El Monte water pumping plant and to Lakeside, about six miles 48-in. welded steel pipe, and two miles 36-in. for high-pressure water service (alternate bids will be asked on riveted steel pipe, cast iron and reinforced concrete pipe). Total cost about \$600,000. H. N. Savage, San Diego, is engineer.

Taggart Brothers, Big Rapids, Mich., will soon begin construction of welded steel pipe line from natural gas fields to Big Rapids and vicinity, about 11 miles.

Richmond, Ky., let contract to O. V. Arnett, Berea, Ky., for municipal gas distribution lines, about 11,150 ft. of 3 to 10-in. steel pipe.

Plaquemine, La., holds special election Nov. 28 to approve construction of joint 4 and 6-in. steel pipe line system with Port Allen, La., for municipal gas distribution; also for construction of sewerage systems. Total cost \$225,000. L. J. Voorhies, Baton Rouge, La., is engineer.

Railroad Equipment

United States Navy Department, Washington, has ordered four 30-ton, 36-in. gage flat cars from American Car & Foundry Co., for service at Pearl Harbor, Hawaii.

Pennsylvania Railroad will build 500 automobile box cars of large dimensions in its own shops.

Scrap Stagnant at Detroit

DETROIT, Nov. 14.—The local scrap market has been virtually devoid of sales, and dealers expect the holiday in buying to continue for at least the next 30 days. With the automobile industry almost at a standstill, only meager tonnages of scrap are coming out at the moment. Prices are unchanged but nominal in the absence of transactions.

Millholland Sales Co., 1115 East Thirty-fifth Street, Indianapolis, has purchased the goodwill, jigs and fixtures, and inventory of parts of the Millholland Corp., which formerly manufactured automatic drilling machines and automatic unit drill heads. Repair parts for these machines, as well as a number of sizes of the automatic machine unit, will be carried in stock.

Metal Consumers Uneasy; Prices Unresponsive to Dollar Weakness

First Quarter Tin Is Sold as Straits Rises to 55.20c. on Unprecedented Dollar "Cheapening"—Copper Uncertain

NEW YORK, Nov. 14.—Custom smelters booked a number of competitive parcels of electrolytic copper last week which aggregated about 1000 tons. A few large consumers are picking up some tonnage at 8.25c. in order to counteract recent purchases at 9c., but most operators are definitely withholding action until the first reliable report of the code provisions is available. Mine producers continue to quote electrolytic nominally at 9c., and custom smelters and outside interests are holding firmly at 8.25c. a lb., delivered Connecticut Valley. The volume of market trading, small as it is, is enabling custom interests partially to move scrap intakes, and thereby establish a price level for scrap purchases. Producers are wholly out of the domestic market, but they are in a well booked position as a result of mid-year sales. The arrival of Deputy Administrator King in New York today presages acceleration of code

deliberations. The trade doubts the ability of the Government to establish a code satisfactory to both mine and custom producers. Current sentiment seems to favor a code confined to minimum wages and fair practices without definite provisions regarding production quotas or market prices. European trading is active on a basis of 8c. to 8.25c. a lb., c.i.f. usual Continental ports.

Tin

Anticipating additional sterling strength domestic consumers bought prompt and first quarter metal in moderate volume throughout the past seven-day period. Prices late last week approximated 53.50c. a lb., New York, but soared to 55.20c. today as Britain's pound skyrocketed to \$5.33. At \$5.33 the dollar was probing depths untouched since the Civil War, and further shrinkage is indicated. The London market is comparatively steady, with today's postings estab-

lishing spot standard at £229 15s., future standard £1 lower, and Singapore slightly higher at £232 10s.

Zinc

Consumers are generally disinterested in spelter, but the market is deriving some strength from the improved position of ore in the Tri-State district. Market trading is currently confined to routine carlots for consumption and occasional speculative parcels. Prompt and January metal is available at a comparatively firm price of 4.50c. a lb., East St. Louis, or 4.85c., New York. Last week's sales aggregated 1570 tons, of which 1280 tons was sold at 4.50c. a lb., and the remainder sold forward at 4.65c. October sales of Prime Western for October delivery amounted to 5473 tons at an average weighted selling price of 4.745c. a lb.; sales for subsequent delivery totaled 6361 tons at 4.751c. a lb. As in other metals, zinc consumers are apparently unafraid of immediate inflationary moves, and are delaying forward purchases until commodity trends are more clearly defined. Joplin concentrates are priced from \$28.50 to \$30 a ton, and the latter quotation is expected to prevail throughout the week. Production for the week reached 6700 tons, whereas sales were only 3600 tons. Stocks increased slightly to 10,300 tons, but should show a decrease this week if threatened curtailment materializes.

Lead

Fabricators are accepting shipments on old contracts in satisfactory volume, but the current market is quiet and uninteresting. Major sellers are not booking their daily ore intake because of consumer caution regarding forward commitments arising from the general desire to await a broad commodity reaction to the Governmental international gold policy. Quotations are being maintained at 4.15c. a lb., St. Louis, and 4.30c., New York, and are considered fairly firm inasmuch as recent shaded bids have been ignored in all directions. Estimated December requirements remain less than 25 per cent sold, and November metal already booked exceeds sales made for shipment in October. A sizable potential demand is, therefore, bolstering the market, and active trading would probably follow the first reliable movement of prices upward.

The Week's Prices. Cents Per Pound for Early Delivery

	Nov. 9	Nov. 10	Nov. 11	Nov. 13	Nov. 14
Electrolytic copper, N. Y.*.....	7.75	8.00	8.00	8.00	8.00
Lake copper, New York.....	8.00	8.25	8.25	8.25	8.25
Straits tin, Spot, N. Y.....	53.60	53.37 1/2	.....	53.87 1/2	55.20
Zinc, East St. Louis.....	4.50	4.50	4.50	4.50	4.50
Zinc, New York.....	4.85	4.85	4.85	4.85	4.85
Lead, St. Louis.....	4.15	4.15	4.15	4.15	4.15
Lead, New York.....	4.30	4.30	4.30	4.30	4.30

*Refinery quotations; price 1/4c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 7.20c. a lb., New York.
Brass ingots, 85-5-5-5, 8.75c. a lb., New York and Philadelphia.

From New York Warehouse Delivered Prices, Base per Lb.

Tin, Straits pig.....	57.00c. to 58.00c.
Tin, bar.....	59.00c. to 60.00c.
Copper, Lake.....	9.25c. to 10.00c.
Copper, electrolytic.....	9.00c. to 9.50c.
Copper, castings.....	8.75c. to 9.75c.
*Copper sheets, hot-rolled.....	17.12 1/2c.
*High brass sheets.....	14.75c.
*Seamless brass tubes.....	16.37 1/2c.
*Seamless copper tubes.....	16.62 1/2c.
*Brass rods.....	12.25c.
Zinc, slabs.....	6.00c. to 7.00c.
Zinc sheets (No. 9), casks.....	9.75c. to 10.00c.
Lead, American pig.....	5.12 1/2c. to 6.12 1/2c.
Lead, bar.....	6.12 1/2c. to 7.12 1/2c.
Lead, sheets.....	8.00c.
Antimony, Asiatic.....	8.50c. to 9.50c.
Alum., virgin, 99 per cent plus.....	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.....	18.00c. to 19.00c.
Solder, 1/2 and 1/2.....	32.00c. to 33.00c.
Babbitt metal, commercial grade.....	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse Delivered Prices per Lb.

Tin, Straits pig.....	56.625c.
Tin, bar.....	58.625c.

Copper, Lake.....	9.50c. to 9.625c.
Copper, electrolytic.....	9.50c. to 9.625c.
Copper, castings.....	9.25c.
Zinc, slab.....	5.75c. to 6.00c.
Lead, American pig.....	5.00c. to 5.25c.
Lead, bar.....	8.00c.
Antimony, Asiatic.....	9.00c.
Babbitt metal, medium grade.....	19.75c.
Babbitt metal, high grade.....	60.625c.
Solder, 1/2 and 1/2.....	32.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	5.75c.	7.25c.
Copper, hvy. and wire.....	5.75c.	7.00c.
Copper, light and bottoms.....	5.00c.	5.75c.
Brass, heavy.....	3.50c.	4.00c.
Brass, light.....	3.00c.	3.50c.
Hvy. machine composition.....	4.50c.	5.125c.
No. 1 yel. brass turnings.....	4.25c.	5.00c.
No. 1 red brass or compos. turnings.....	4.00c.	4.75c.
Lead, heavy.....	3.25c.	3.625c.
Zinc.....	2.50c.	3.00c.
Cast aluminum.....	7.25c.	8.50c.
Sheet aluminum.....	11.25c.	12.75c.

Scrap Code Hearing To Be Held Nov. 23

HEARING will be held Nov. 23 on the code of fair competition presented by the Institute of Scrap Iron and Steel. Joined with this code is one filed by the Wool Stock Council covering waste materials. The hearing will be conducted under the supervision of Division Administrator A. D. Whiteside of the NRA.

Lump Peat As a Fuel for Blast Furnaces

(Concluded from Page 17)

found to be sufficient if operating on peat.

The unfavorable phenomenon consists in the gradual and periodical blocking (plugging) up of the hearth of the blast-furnace, which causes the tapping of slag through the slag hole to be stopped, and plugging up of the tuyeres.

In order to make it easier to avoid the blocking up of the hearth during the time when the furnace is working on the agglomeration product or on the mixture of the latter and 60 per cent iron ore used in equal proportions, it is necessary to maintain the relative quantity of slag corresponding to 0.5-0.6 per ton pig iron. The recommended quantity CaO in slag is 46-48 per cent.

In order to improve the working conditions of the blast furnace measures were taken for systematically adding the charge of coke without bringing changes in the peat charge.

The committee assumes that it is possible to use peat as fuel for blast-furnace with an effective height and capacity corresponding to 21 m. and about 375 cub. meters only, in such cases when coke is periodically added in a quantity amounting to 5 per cent by weight of used peat.

The work of the furnace may be carried out by means of using the agglomeration product of calcined pyrites only without iron ore. When working on the mixture of agglomeration product and iron ore used in equal quantities appreciable advantages were not obtained as regards to the furnace functioning properly.

Besides this, such a charge lowers the daily output of pig iron. The daily output of the blast-furnace is equal to 2/3 of that gained, when coke is used.

The peat consumption is equal to 3.5-4.0 tons per ton open-hearth pig iron when agglomeration product alone is used. The peat consumption for cast-iron was not calculated.

The committee considers that, by means of using peat for the blast-furnace smelting process, it is possible to produce both open-hearth pig iron and foundry pig iron of the desired composition.

The quantity of gas produced during the process is equal to 5.500-5.600 cubic meters per ton pig iron instead of 3.600-4.000 cubic meters of gas obtained during the time when the smelting process is carried out on coke.

In the first case the calorific value of one cubic meter of gas is equal to

about 1.500 cal. and in the second case it is equal to about 950 cal. The composition of blast-furnace gas is as follows: CO₂, 9-10 per cent; CO, 28-29 per cent; H₂, 8-12 per cent; CH₄, 1-2 per cent; CNH₃N, 0.5 per cent.

Tar, which is the product obtained from the coking process of the peat in the furnace, settled out, together with the ore dust, in the gas line during the experimental smelting test and was not utilized, as methods for recovering it have not been developed.

The above-mentioned smelting tests gave favorable results and at the same time considerable actual data for being able to begin projecting and constructing iron works in the above-mentioned central districts of Soviet Union with peat and calcined pyrites serving as raw materials.



A SOUND SPECIFICATION

Wherever Exactness To Size, Straightness, Unvarying Cross-Sections And Guaranteed Machining Performance Are Essential.

Carbon and Alloy

ROUNDS $\frac{1}{8}$ " to 6" inclusive

SQUARES $\frac{1}{4}$ " to 4" inclusive

HEXAGONS $\frac{1}{4}$ " to 3" inclusive

FLATS $\frac{1}{8}$ " x $\frac{3}{8}$ " to 2" x 6" inclusive

SPECIAL SHAPES AS DESIRED

TURNED AND POLISHED SHAFTING

TURNED AND GROUND SHAFTING

WYCKOFF DRAWN STEEL COMPANY

GENERAL OFFICES—Ambridge, Penna.

MILLS—Ambridge, Penna. and Chicago, Ill.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES Iron and Steel Bars Soft Steel

Base per Lb.
F.o.b. Pittsburgh mill
F.o.b. Chicago or Gary
Del'd Philadelphia
Del'd New York
F.o.b. Cleveland
F.o.b. Buffalo
F.o.b. Birmingham
F.o.b. cars dock Pacific
ports
F.o.b. cars dock Gulf ports

Base per Lb.
F.o.b. Cleveland
F.o.b. Chicago
F.o.b. Gary
F.o.b. Pittsburgh
F.o.b. Buffalo
F.o.b. Birmingham
F.o.b. cars dock Gulf ports

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F.o.b. cars dock Pacific
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F.o.b. cars dock Gulf ports

differential for cold-drawn bars is 1/4c. per lb. higher with separate extras. Blooms, billets and slabs under 14 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 14 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Base per Lb.
Bars, f.o.b. Pittsburgh mill
Bars, f.o.b. Chicago
Bars, Cleveland
Bars, Buffalo
Bars, Detroit
Bars, eastern Michigan
Precision round bars, Pittsburgh
Precision round bars, Cleveland
Precision round bars (alloy), Pitts.
Shafting, ground, f.o.b. mill
1-3/16 to 1 1/2 in.
1-9/16 to 1 1/4 in.
1-15/16 to 2 1/4 in.
2-15/16 to 6 in.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
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No. 24, f.o.b. Gary
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No. 24, wrought iron, Pittsburgh

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No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
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No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

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No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
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No. 24, wrought iron, Pittsburgh

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No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Keg
Standard wire nails
Smooth coated nails
Galvanized nails
Base per 100 Lb.
Smooth annealed wire
Smooth galvanized wire
Polished staples
Galvanized staples
Barbed wire, galvanized
Woven wire fence, base column

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

Base per Lb.
No. 10, f.o.b. Pittsburgh
No. 10, f.o.b. Gary
No. 10, del'd Phila.
No. 10, f.o.b. Birmingham
No. 10, f.o.b. dock cars Pacific
ports
No. 24, f.o.b. Pittsburgh
No. 24, f.o.b. Gary
No. 24, del'd Phila.
No. 24, f.o.b. Birmingham
No. 24, f.o.b. dock cars Pacific
ports
No. 24, wrought iron, Pittsburgh

discounts. Intermediate sizes and steel not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing
Carbon, 0.10% to 0.30% base (carbon) 1.00
Carbon, 0.30% to 0.40% base 1.25
Plus differential for lengths over 12 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Base per 100 Lb.
Standard rails, 60-lb. and heavier
per gross ton
Angle bars, per 100 lb.
Base per 100 Lb.
Spikes, 9/16 in. and larger
Spikes, 1/2 in. and smaller
Spikes, boat and barge
Tie plates, steel
Track bolts, to steam railroads
Track bolts, to jobbers, all sizes (per 100 count)

BOLTS, NUTS, RIVETS AND SET SCREWS

Base per 100 Lb.
Machine bolts
Carriage bolts
Lag bolts
Plow bolts, Nos. 1, 2, 3 and 7 heads
Hot-pressed nuts, blank or tapped
Hot-pressed nuts, blank or tapped
Hexagons
C.n.c. and t. square or hex nuts, blank or tapped
Semi-finished hexagon nuts
Semi-finished hexagon castellated nuts
S.A.E. thread, 1 in. dia. and over
Stove bolts in packages, 7/16 in. and over
Stove bolts in packages, 1/2 in. and over
Stove bolts in bulk, 7/16 in. and over
Stove bolts in bulk, 1/2 in. and over
Stove bolts in bulk, Cleveland
Tire bolts

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland
F.o.b. Chicago and Birmingham

Wire Rods (Common soft, base)

	Per Gross Ton
Pittsburgh	\$35.00
Cleveland	35.00
Chicago	35.00
Birmingham	35.00
Youngstown (del'd)	35.00

ALLOY STEEL BLOOMS, BILLETS AND SLABS

F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem. Base price, \$19 a gross ton except at Bethlehem, where it is \$31.

CARBON STEEL FORGING INGOTS

F.o.b. Pittsburgh, Youngstown or Chicago. Uncropped, \$28 per gross ton.

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville	\$3.75
Foundry, f.o.b. Connellsville	\$4.25 to 5.25
Foundry, by-product, Chicago	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	10.50
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	8.50
Foundry, by-product, Cleveland delivered	9.27
Foundry, Birmingham	4.75
Foundry, by-product, St. Louis	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.55 to \$1.80
Mine run coking coal f.o.b. W. Pa.	1.80 to 2.00
Gas coal, 1/4-in. f.o.b. Pa. mines	2.00 to 2.30
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.20
Steam slack, f.o.b. W. Pa. mines	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines	1.65 to 1.85

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 2 distillate	4.00c.
No. 4 industrial	3.50c.
	Per Gal. f.o.b. Baltimore
No. 2 distillate	4.00c.
No. 4 industrial	3.50c.
	Per Gal. del'd Chicago
No. 2 industrial fuel oil	3.73c.
No. 3 industrial fuel oil	3.23c.
	Per Gal. f.o.b. Cleveland
No. 2 distillate	5.50c.
No. 4 industrial	5.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works
High-heat	Intermediate
Duty Brick	Duty Brick
Pennsylvania	\$45.00
Maryland	48.00
New Jersey	55.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

Chrome Brick

	Per Net Ton
Standard size	\$45.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$65.00
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Cheveland, Wash.	22.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$43.00 to \$44.00
4-in., del'd Chicago	46.00 to 47.00
6-in. and larger, del'd New York	43.00
4-in., del'd New York	46.00
6-in. and larger, Birmingham	\$35.00 to 36.00
4-in., Birmingham	38.00 to 39.00
Class "A" and gas pipe, \$3 extra.	

Pig Iron, Ores, Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$18.00	\$18.50	\$17.50	\$19.00
Bethlehem, Pa.	17.50	18.00	17.00	18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sperrows Point, Md.	17.50	18.00	17.00	18.50
Neville Island, Pa.	17.50	17.50	17.00	18.00
Shirpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Buffalo	17.50	18.00	16.50	18.50
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	18.00
Duluth, Minn.	18.00	18.00	12.50	18.50
Birmingham	13.50			
Provo, Utah	16.50			

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	\$18.50	\$19.00	\$18.00	\$19.50
From Buffalo	18.50	19.00	18.00	19.50
Brooklyn				
From East. Pa. or Buffalo	19.77	20.27	19.27	20.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	18.89	19.39	18.39	19.89
Philadelphia				
From Eastern Pa.	18.26	18.76	17.76	19.26
Cincinnati				
From Hamilton, Ohio	18.51	18.51	18.01	19.01
Canton, Ohio				
From Cleveland and Youngstown	18.76	18.76		
Columbus, Ohio				
From Hamilton, Ohio	19.50	19.50		
Mansfield, Ohio				
From Cleveland and Toledo	19.26	19.26		
Indianapolis				
From Hamilton, Ohio	19.77	19.77		
South Bend, Ind.				
From Chicago	19.55	19.55		
Milwaukee				
From Chicago	18.50	18.50		
St. Paul				
From Duluth	19.44			
Davenport, Iowa				
From Chicago	19.26	19.26		
Kansas City				
From Granite City	20.04	20.54		

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	Per Gross Ton
Johnson City, Tenn.	22.00
F.o.b. Valley furnace	22.00
Del'd Chicago	27.65

GRAY FORGE PIG IRON

Valley furnace	\$17.50
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CHARCOAL PIG IRON

Lake Superior furnace	\$20.50
Delivered Chicago	23.54
Delivered Buffalo	23.78

CANADA Pig Iron

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.75	22.00
Malleable	22.50
Basic	22.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard, (carload)	\$82.00
Domestic, 80%, seaboard, (less carloads)	89.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$27.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	\$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Weiland	
Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	35.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace			
	Per Gross Ton		Per Gross Ton
6%	.....\$22.25	12%	.....\$29.25
7%	.....23.25	13%	.....30.75
8%	.....24.25	14%	.....32.25
9%	.....25.25	15%	.....33.75
10%	.....26.25	16%	.....35.25
11%	.....27.75	17%	.....36.75

Ferrovanadium, del., per lb. contained Van.	\$2.60 to \$2.80
Ferrocobalt, 15 to 18% per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18% Rockdale, Tenn., base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.5% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c.
Iron, low phos., Swedish, average 68 1/4% iron	8.50c.
Iron, basic or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, average, 65% iron (nom.)	8c.
Manganese, Caucasian, washed 52%	22c.
Manganese, African, Indian, 44-48%	20c.
Manganese, African, Indian, 49-51%	21c.
Manganese, Brazilian, 46 to 48 1/2%	17c.

Per Net Ton Unit

Tungsten, Chinese wolframite, duty paid*	\$12.00
Tungsten, domestic scheelite*	\$11.00 to \$12.00

Per Gross Ton

Chrome, 45%, Cr2O3, crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr2O3, c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sales.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines	\$15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	18.50
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.25 to \$11.75
No. 2 heavy melting steel	10.25 to 10.75
No. 2 railroad wrought	11.25 to 11.75
Scrap rails	11.25 to 11.75
Rails 3 ft. and under	14.00 to 14.50
Sheet car crops, ordinary	13.00 to 13.50
Compressed sheet steel	11.25 to 11.75
Hand bundled sheet steel	10.25 to 10.75
Hvy. steel axle turnings	10.25 to 10.75
Machine shop turnings	8.00 to 8.50
Short mixed borings and turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Cast iron car wheels	11.00 to 11.50
Heavy breakable cast	10.50 to 11.00
No. 1 cast	11.00 to 11.50
Rail, knuckles and couplers	13.00 to 13.50
Rail, coil and leaf springs	13.00 to 13.50
Roller steel wheels	13.00 to 13.50
Low phos. billet crops	15.00 to 15.50
Low phos. sheet bar crops	14.50 to 15.00
Low phos. plate scrap	14.00 to 14.50
Low phos. punchings	14.50 to 15.00
Steel car axles	13.50 to 14.50

CHICAGO

Delivered Chicago district consumers:	
Heavy melting steel	\$8.50 to \$9.00
Shoveling steel	8.50 to 9.00

Hydraulic comp. sheets	\$7.25 to \$7.75
Drop forge flashings	6.50 to 7.00
No. 1 busheling	7.00 to 7.50
Roller car wheels	9.50 to 10.00
Railroad leaf springs	10.00 to 10.50
Axle turnings	7.50 to 8.00
Steel couplers and knuckles	9.50 to 10.00
Coil springs (elec. fur.)	10.50 to 11.00
Axle turnings (elec. fur.)	7.50 to 8.00
Low phos. punchings	10.50 to 11.00
Low phos. plates, 12 in. and under	10.50 to 11.00
Cast iron borings	5.00 to 5.50
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	5.00 to 5.50
Revolving rails	10.00 to 10.50
Steel rails, less than 3 ft.	10.00 to 10.50
Steel rails, less than 2 ft.	9.50 to 10.00
Angle bars, steel	9.00 to 9.50
Cast iron car wheels	9.00 to 9.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00

Per Net Ton

Iron car axles	\$11.00 to \$11.50
Steel car axles	9.50 to 10.00
No. 1 railroad wrought	7.25 to 7.75
No. 2 railroad wrought	7.50 to 8.00

No. 2 busheling	\$3.50 to \$4.00
Locomotive tires, smooth	8.50 to 9.00
Pipe and flues	4.25 to 4.75
No. 1 machinery cast	8.50 to 9.00
Clean automobile cast	8.00 to 8.50
No. 1 railroad cast	7.50 to 8.00
No. 1 agricultural cast	7.00 to 7.50
Stove plate	6.00 to 6.50
Grate bars	6.00 to 6.50
Brake shoes	7.50 to 8.00

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$9.50 to \$10.00
No. 2 heavy melting steel	8.00 to 8.50
No. 1 railroad wrought	14.00 to 14.50
Bundled sheets	8.00 to 8.50
Hydraulic compressed, new	9.50 to 10.00
Hydraulic compressed, old	8.00 to 8.50
Machine shop turnings	6.00 to 6.50
Cast borings	9.00
Heavy breakable cast	9.50 to 10.00
Stove plate (steel works)	8.50
No. 1 low phos. heavy	13.00 to 14.00
Couplers and knuckles	12.00 to 12.50
Roller steel wheels	12.00 to 12.50
No. 1 blast furnace	6.00
Spec. iron and steel pipe	8.50 to 9.00
Shafting	14.50 to 15.00
Steel axles	11.50 to 12.00
No. 1 forge fire	10.00
Cast iron car wheels	10.50 to 11.00
No. 1 cast	11.00 to 11.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00 to 12.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$9.50 to \$10.00
No. 2 heavy melting steel	9.00 to 9.50
Compressed sheet steel	9.00 to 9.50
Light bundled sheet stamp	
Ingots	6.50 to 7.00
Drop forge flashings	9.00 to 9.50
Machine shop turnings	7.00 to 7.50
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
Steel axle turnings	7.50 to 8.00
Low phos. billet crops	12.50 to 13.00
Cast iron borings	7.00 to 7.50
Mixed borings and short	
turnings	7.00 to 7.50
No. 2 busheling	7.00 to 7.50
No. 1 railroad	11.00 to 11.50
Railroad grate bars	7.50 to 8.00
Stove plate	7.50 to 8.00
Rails under 3 ft.	10.00 to 10.50
Rails for rolling	10.50 to 11.00
Railroad malleable	10.00 to 10.50
Cast iron car wheels	11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$9.00 to \$9.50
No. 2 heavy melting scrap	8.00 to 8.50
Scrap rails	8.50 to 9.00
New hydraulic comp. sheets	8.00 to 8.50
Old hydraulic comp. sheets	7.00 to 7.50
Drop forge flashings	8.00 to 8.50
No. 1 busheling	8.00 to 8.50
Hvy. steel axle turnings	8.50 to 9.00
Machine shop turnings	9.00 to 9.50
Knuckles and couplers	11.00 to 11.50
Coll and leaf springs	11.00 to 11.50
Roller steel wheels	11.00 to 11.50
Low phos. billet crops	12.50 to 13.00
Short shov. steel turnings	7.00 to 7.50
Short mixed borings and	
turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
No. 2 busheling	6.00 to 6.50
Steel car axles	11.00 to 12.00
Iron axles	11.00 to 12.00
No. 1 machinery cast	10.50 to 11.00
No. 1 cupola cast	10.00 to 10.50
Stove plate	8.75 to 9.25
Steel rails, 3 ft. and under	12.50 to 13.00
Cast iron car wheels	10.00 to 10.50
Industrial malleable	10.50 to 11.00
Railroad malleable	10.50 to 11.00
Chemical borings	9.00 to 10.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$10.00 to \$10.50
Scrap steel rails	9.00 to 9.50
Short shoveling turnings	5.50
Stove plate	7.00 to 7.50
Steel axles	11.00 to 11.50
Iron axles	11.00 to 11.50
No. 1 railroad wrought	7.00
Rails for rolling	10.50
No. 1 cast	9.50 to 10.00
Tramcar wheels	9.50 to 10.00
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$8.50 to \$9.00
No. 1 heavy melting	7.50 to 8.00
No. 2 heavy melting	7.00 to 7.50
No. 1 locomotive tires	8.00 to 8.50
Misc. stand.-sec. rails	9.00 to 9.50
Railroad springs	9.00 to 9.50
Bundled sheets	8.00 to 8.50
No. 2 railroad wrought	7.50 to 8.00
No. 1 busheling	6.50 to 7.00
Cast iron borings and	
shoveling turnings	4.50 to 5.00
Rails for rolling	9.25 to 9.75
Machine shop turnings	4.25 to 4.75
Heavy turnings	3.50 to 4.00
Steel car axles	10.00 to 10.50
Iron car axles	12.50 to 13.00
Wrot. iron bars and trans.	9.00 to 9.50
No. 1 railroad wrought	6.25 to 6.75
Steel rails less than 3 ft.	11.00 to 11.50
Steel angle bars	9.00 to 9.50
Cast iron car wheels	6.75 to 7.25
No. 1 machinery cast	8.00 to 8.50
Railroad malleable	8.50 to 9.00
No. 1 railroad cast	8.00 to 8.50
Stove plate	6.50 to 7.00
Relay rails, 60 lb. and	
under	16.00 to 16.50

Relay rails, 60 lb. and	
over	\$20.00 to \$21.00
Agricult. malleable	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$5.50 to \$6.00
Scrap T rails	5.50 to 6.00
Machine shop turnings	2.50 to 2.75
Cast iron borings	4.00 to 4.25
Bundled skeleton, long	4.75 to 5.00
Forge flashings	4.75 to 5.00
Blast furnace scrap	4.75 to 5.00
Shafting	9.00 to 9.50
Steel car axles	8.50 to 9.00
Wrought pipe	3.50 to 4.00
Rails for rolling	6.00 to 6.50
Cast iron borings, chemical	7.50 to 8.00

Per gross ton delivered consumers' yards:	
Textile cast	\$10.00 to \$10.50
No. 1 machinery cast	10.00 to 10.50
Stove plate	6.25 to 6.50
Railroad malleable	11.00 to 12.00

NEW YORK

Dealers' buying prices per gross ton:	
Prices in italics for loading on barge; all others for loading on cars.	
No. 1 heavy melting steel	\$6.50 to \$7.50
No. 2 heavy melting steel	5.50 to 6.50
Unprepared yard iron and	
steel	3.00 to 3.50
Machine shop turnings	3.00 to 3.50
Short shoveling turnings	3.00 to 3.50
Cast borings	4.50 to 4.75
No. 1 blast furnace	2.50 to 3.00

PITTSBURGH

Base per Lb.	
Plates	2.85c
Structural shapes	2.85c
Soft steel bars and small shapes	2.85c
Reinforcing steel bars	3.00c
Cold-finished and screw stock	
Rounds and hexagons	3.20c
Squares and flats	3.20c
Hoops and bands, under 1/4 in.	3.10c
Hot-rolled annealed sheets (No. 24),	
25 or more bundles	3.15c
Galv. sheets (No. 24), 25 or more	3.50c
Hot-rolled sheets (No. 10)	3.85c
Galv. corrug. sheets (No. 28), per	
square (more than 3750 lb.)	\$3.32
Spikes, large	2.40c
Small	2.65c
Boat	2.90c
Track bolts, all sizes, per 100 count	
Machine bolts, 100 count	65 per cent off list.
Carriage bolts, 100 count	65 per cent off list.
Nuts, all styles, 100 count	
Large rivets, base per 100 lb.	\$3.25
Wire, black, soft ann'l'd, base per	
100 lb.	2.90
Wire, galv. soft, base per 100 lb.	3.35
Common wire nails, per keg	2.40
Cement coated nails, per keg	2.40
On plates, structural, bars, reinforcing	
bars, bands, hoops and blue annealed	
sheets, base applied to orders of 400 to	
9999 lb.	

CHICAGO

Base per Lb.	
Plates and structural shapes	3.10c
Soft steel bars	2.90c
Cold-fn. steel bars and shafting	
Rounds and hexagons	3.25c
Flats and squares	3.25c
Bands, 3/16 in. (in Nos. 10 and	
12 gages)	3.20c
Hoops (No. 14 gage and lighter)	3.20c
Hot-rolled annealed sheets (No. 24)	3.70c
Galv. sheets (No. 24)	4.30c
Hot-rolled sheets (No. 10)	3.85c
Spikes (9/16 in. and lighter)	3.50c
Track bolts	4.50c
Rivets, structural (leg lots)	3c
Rivets, boiler (leg lots)	3.10c
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq. tap, or	
blank	60 and 5
Hot-pressed nuts, hex. tap, or	
blank	60 and 5
Hex. head and cap screws	85 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotters	60 and 10
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and	
smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'l'd wire per 100 lb.	\$3.45
Com. wire nails, base per keg	2.70c
Cement c't'd nails, base per keg	2.70c

NEW YORK

Base per Lb.	
Plates	3.30c
Structural shapes	3.27c
Soft steel bars, small shapes	3.17c
Iron bars	3.24c
Iron bars, swed. charcoal, 6.50 to 7.00c	
Cold-fn. shafting and screw stock	
Rounds and hexagons	3.79c
Flats and squares	4.29c
Cold-roll. strip, soft and quarter	
hard	4.00c
Hoops	3.42c
Bands	3.42c
Hot-rolled sheets (No. 10)	3.17c
Hot-rolled ann'l'd sheets (No. 24*)	3.65c
Galvanized sheets (No. 24)	4.25c
Long term sheets (No. 24)	4.75c
Standard tool steel	12.00c
Wire, black annealed (No. 10)	3.60c
Wire, galv. annealed (No. 10)	4.05c

Steel car axles	\$10.00 to \$10.50
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.00 to 6.00
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Rails for rolling	8.50 to 9.00
Heavy breakable cast	5.00 to 6.00
No. 1 machinery cast	6.50 to 7.00
No. 2 cast	5.50 to 6.00
Cast borings (chemical)	5.50 to 6.00
Cast borings	12.00 to 12.50

Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$8.00
No. 1 hvy. cast (cupola	
size)	7.75
No. 2 cast	7.00

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$7.75 to \$8.50
Scrap rails for melting	8.50 to 9.00
Loss sheet clippings	4.75 to 5.25
Bundled sheets	5.75 to 6.25
Cast iron borings	5.75 to 6.25
Machine shop turnings	5.25 to 5.75
No. 1 busheling	6.00 to 6.50
No. 2 busheling	3.00 to 3.50
Rails for rolling	9.00 to 9.50
No. 1 locomotive tires	8.50 to 9.00
Short rails	11.25 to 11.75
Bundled sheets	5.75 to 6.25
No. 1 machinery cast	9.00 to 9.50
No. 1 railroad cast	8.50 to 9.00
Burnt cast	6.00 to 6.50
Stove plate	6.00 to 6.50
Agricultural malleable	8.00 to 8.50
Railroad malleable	8.50 to 9.00

Warehouse Prices for Steel Products

Tire steel 1/2 x 1/2 in. and larger	3.40c
Smooth finish, 1 to 2 1/2 x 1/2 in.	
and larger	3.75c
Open hearth spring steel, bases	
1 x 30 in. and smaller	\$7.50 to 10.00c
Common wire nails, base, per keg	\$3.00
Per Cent Off List	
Machine bolt, cut thread:	
1/2 x 6 in. and smaller	60
1 x 30 in. and smaller	60
Carriage bolts, cut thread:	
1/2 x 6 in. and smaller	60
1 x 20 in. and smaller	50
Boiler tubes:	
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	65.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.34c
Bars, soft steel or iron	3.14c
Cold-fn. rounds, shafting, screw	
stock	3.59c
Hot-rolled annealed sheets (No. 24)	3.94c
Galv. sheets (No. 24)	4.54c
Hot-rolled sheets (No. 10)	3.19c
Black corrug. sheets (No. 24)	3.65c
Galv. corrug. sheets	4.30c
Structural rivets	3.34c
Boiler rivets	3.44c
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	65
Machine and carriage bolts, lag screws,	
fitting up bolts, bolt ends, plow bolts,	
hot-pressed nuts, square and hexagon,	
tapped or blank, semi-finished nuts	
1000 lb. or over	65
200 to 999 lb.	60
100 to 199 lb.	55
Less than 100 lb.	50

PHILADELPHIA

Base per Lb.	
*Plates, 1/4-in. and heavier	2.60c
*Structural shapes	2.60c
*Soft steel bars, small shapes, iron	
bars (except bands)	2.60c
*Reinforce steel bars, sq. twisted	2.28c
and deformed	2.28c
*Cold-finished steel bars	3.58c
*Steel hoops	3.15c
*Steel bands, No. 12 to 3/16 in.	
incl.	2.90c
Spring steel	5.00c
*Hot-rolled annealed sheets (No. 24)	3.40c
*Galvanized sheets (No. 24)	4.00c
*Hot-rolled annealed sheets (No.	
10)	2.75c
Diam. pat. floor plates, 1/4 in.	4.35c
Swedish iron bars	6.00c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 5 tons or more, exclusive of cutting charge.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	3.21c
Soft steel bars	2.90c
Reinforce steel bars	2.00c to 2.50c
Cold-finished steel bars	3.25c
*Hot-rolled steel under 1/4 in.	3.26c
Cold-finished strip	5.55c
Hot-rolled annealed sheets (No. 24)	3.76c
Galvanized sheets (No. 24)	4.36c
Hot-rolled sheets (No. 10)	3.01c
Black ann'l'd wire, per 100 lb.	\$2.55
No. 9 galv. wire, per 100 lb.	2.90
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.30c
Bars, soft steel or iron	3.10c
New billet reinforce. bars	3.10c
Rail steel reinforce. bars	3.10c

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$6.75 to \$7.25
Borings and short turnings	5.75 to 6.25
Long turnings	5.25 to 5.75
No. 1 machinery cast	7.50 to 8.00
Automotive cast	9.50 to 10.00
Hydraulic comp. sheets	6.75 to 7.25
Stove plate	3.75 to 4.25
New factory busheling	5.75 to 6.25
Old No. 2 busheling	4.50 to 5.00
Sheet clippings	4.50 to 5.00
Flashings	5.50 to 6.00
Low phos. plate scrap	7.50 to 8.00

CANADA

Dealers' buying prices per gross ton:	
Toronto Montreal	
Heavy melting steel	\$5.50 \$5.50
Rails, scrap	6.00 4.50
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.50 2.5

ton:	
Montreal	\$5.50
	4.50
	2.50
	4.50
	2.50
	3.00
	2.00
	2.50
	6.00
	6.50
	9.00
	5.00
	7.00
	7.00

...	3.35e.
...	3.55e.
(24)	3.85e.
...	4.45e.
...	3.10e.
...	4.00e.
ent off Hist	\$3.00
0	
...	2.05
...	2.50
eg...	2.95
...	8.35
er 100 Ft.	\$16.86
...	37.50
in.	15.65
...	34.85

..	3.20e.
..	2.95e.
..	1.95e.
..	3.25e.
..	3.25e.
..	5.25e.
4)	3.25e.
..	4.00e.
..	3.30e.
..	3.55e.
..	3.10e.
..	\$3.04
..	3.25

Per Lb.
... 2.75c
... 2.75c
... 2.75c
... 4.65c
... 2.65c
to 3.65c
to 5.40c
and 3.90c
... 4.50c
... 4.75c
... 3.70c
... 5.20c
... 4.20c
... 2.65c
... 5.50c
... 3.90c
... 4.00c
... 5.00c
: extras

per Lb.

Seattle

3.40c.

3.40c.

3.60c.

3.40c.

3.50c.

4.25c.

3.65c.

4.85c.

5.00c.

4.75c.

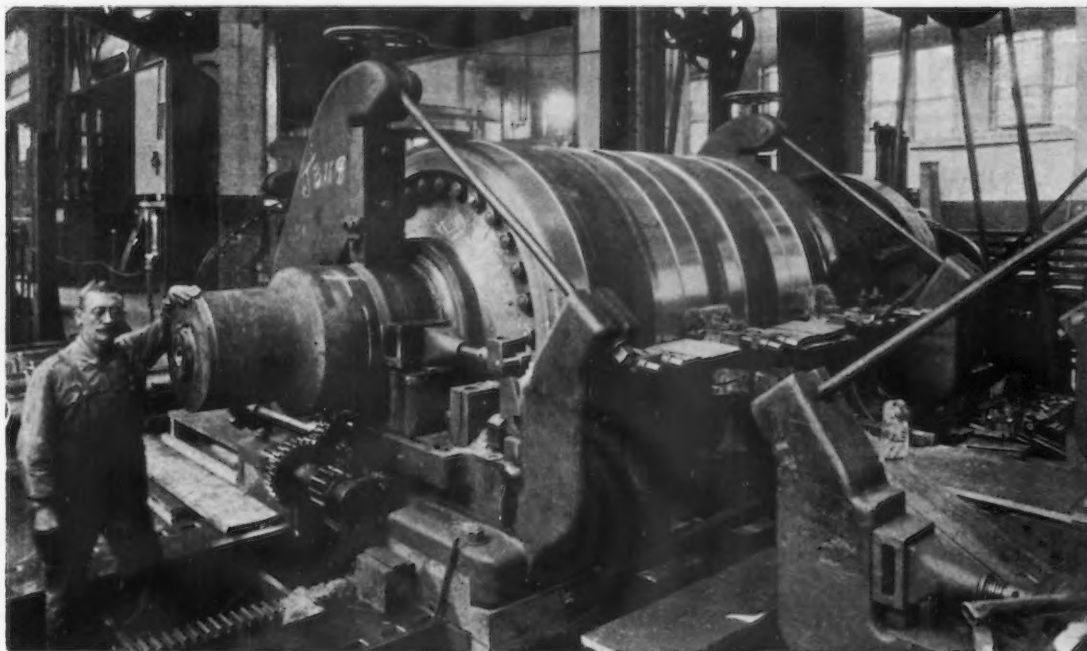
6.00c.

7.00c.

\$2.90

als for

Four broad cutting tools are here shown in the operation of facing a 72-in. roll for an asbestos sheeting calender.



Extreme Accuracy in Large Roll Finishing

(Concluded from Page 16)

material, and, finally, an iron casing to line the inside of the pit.

A whole new set of special chills was necessary for the large roll and because of the weight, new chain and lifting equipment had to be installed. The new equipment included a 40-ft. crane with a 50-ton trolley and an I-beam bracing-structure for the crane runway. In removing the roll from the pit after casting, but one crane could be used and it was necessary to exert a momentary force of 60 tons to loosen the roll from the mold forming the bottom neck. The upper mold and chills, of course, previously had been removed. After the roll was taken from the pit to the foundry floor, two cranes could be used to lift it and this simplified further handling. In pouring, two special electrically operated ladles were employed, one with a 35- and the other with a 30-ton capacity. These ladles were controlled by an operator from the crane overhead, eliminating the danger which would result if men on high stagings should be forced to operate. The iron poured from both ladles entered two runners on opposite sides. A total of 63 tons of metal of a special mixture was melted in the cupolas for this roll. In the roll shop the grinding equipment was of sufficient capacity for finishing, but it was necessary to lengthen one of the facing lathes. One of the most complicated problems was in the design of the roll itself. It was necessary to give the roll sufficient crown to exactly compensate for the slight spring caused by the weight of the rolls above in the stack. The amount of this crown was worked out mathematically.

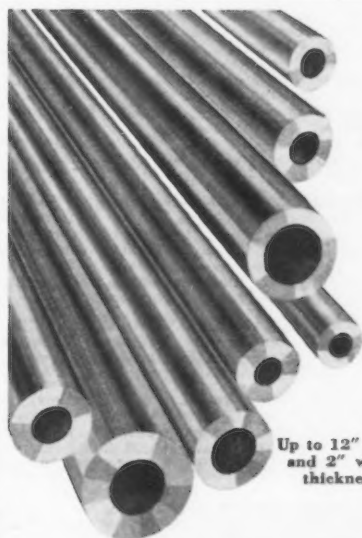
by the Farrel engineers and the roll was ground accordingly. When the stack was set up, the contact was found to be perfect.

September Motor Car Production 196,082

WASHINGTON, Nov. 10.—Motor vehicle production in September declined to 196,082 units from 236,487

In August, according to reports received by the Bureau of the Census from 120 manufacturers. Passenger car output dropped to 160,891 from 195,076, while truck production decreased to 35,182 from 41,343. In the first nine months of the current year production of motor vehicles rose sharply to 1,672,767 from 1,155,066 in the corresponding period of last year. Passenger car output increased to 1,398,903 from 188,363.

Canadian motor vehicle production in September declined to 5808 from 6079 in August. The September output consisted of 4358 passenger cars and 1450 trucks.



**Up to 12" O.D.
and 2" wall
thickness**

TOOL STEEL TUBING

**NON-SHRINK
OIL HARDENING
NON-DEFORMING**

for RING DIES
CUTTING DIES
SPACERS, BUSHINGS, Etc.

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

THE BISSETT STEEL CO., INC.

915 E. 67th ST.

Cincinnati

Pittsburgh

CLEVELAND, OHIO

Buffalo

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NEW ENGLAND ▶

Town Council, Adams, Mass., plans installation of pumping machinery and auxiliary mechanical equipment, pipe lines, etc., for extensions and improvements in municipal water system. Cost about \$300,000. Fay, Spofford & Thorndike, 44 School Street, Boston, are consulting engineers.

Apothecaries Hall Co., Benedict Street, Waterbury, Conn., manufacturer of industrial chemicals, etc., has let general contract to Bartlett-Brainard Co., 16 Van Dyke Avenue, Hartford, Conn., for one-story plant at Broad Brook, about 50,000 sq. ft. floor space. Cost about \$75,000 with equipment. John J. Harty, 25 Huntington Avenue, Boston, is engineer.

Board of Trustees, State Teachers' College, Fitchburg, Mass., is considering new practical arts building. Cost about \$98,000 with equipment. Project has been approved by State Emergency Public Works Commission.

Master Boiler Co., Inc., Pawtucket, R. I., has been organized by Joseph P. Tierney, 161 Sixth Street, Providence, R. I., to manufacture boilers and kindred products.

Armstrong Rubber Co., 475 Elm Street, New Haven, Conn., manufacturer of automobile tires, will defer construction of new two and three-story plant unit, 80 x 175 ft., until early next year, when bids will be asked on general contract. Cost over \$70,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, Bridgeport, Conn., is engineer.

State Department of Mental Diseases, State House, Boston, has plans for extensions and improvements in power plant at institution at Medfield, Mass., with installation of new equipment. Cost about \$130,000 with machinery. W. & L. Engineering Co., 694 Washington Street, Boston, is engineer. Also for new steam power house and equipment at state institution at Foxboro, Mass. Cost \$150,000 with machinery. Hollis French, 210 South Street, Boston, is engineer.

◀ BUFFALO DISTRICT ▶

National Aniline & Chemical Co., Abbott Road, Buffalo, plans extensions and improvements in power plant, with installation of additional equipment.

Board of Education, Jamestown, N. Y., plans manual training department in new two-story central high school on Second Street. Cost about \$350,000. Proposed to arrange financing at early date.

A. Szelagowski & Son, 143 Mohr Street, Buffalo, meat packers, have filed plans for new two-story factory on Milburn Street. Cost about \$30,000 with equipment.

Courtaulds (Canada), Ltd., Cornwall, Ont., has let general contract to Foundation Co. of Canada, Ltd., Harbour Street, Toronto, for new two-story addition to rayon mill, 150 x 500 ft. Cost over \$1,000,000 with equipment.

◀ NORTH ATLANTIC ▶

American Consolidated Tin Mines Corp., 120 Liberty Street, New York, is having plans drawn for new tin ore milling plant and development of mining property near Lincoln, N. C. Plant will consist of several units, equipped to handle and separate about 500 tons of ore daily, with power house, machine shop and other mechanical structures. Proposed to have initial mill ready for operation in about six months. Cost over \$100,000 with equipment. U. S. James, 35 Runyon Street, Newark, N. J., is metallurgical engineer.

Superintendent of Lighthouses, St. George, S. I., N. Y., asks bids until Nov. 20 for reconditioning Lightship 87, including new fuel oil tanks, 300-hp. Diesel propelling engine, etc.; bids (no closing date stated) for two 38-ft. buoy boats, with 32-hp. gasoline propelling engine and accessories, A-frame derrick and 10-hp. gasoline hoisting winch.

Pennsylvania Distillery, Inc., 139 Plymouth Street, Brooklyn, with main plant at Logansport, Pa., has leased six-story building at

195 Plymouth Street, and will remodel and equip for new branch plant for distilling, rectifying, blending, etc. Cost over \$50,000 with machinery. Morris R. Weiner is president.

Devco, Inc., New York, has been organized by Benjamin M. Halpern, 271 Palisade Avenue, Union City, N. J., and George W. Cooke, 225 South Grand Avenue, Baldwin, L. I., to manufacture oil equipment and devices.

Board of Education, Park Avenue and Fifty-ninth Street, New York, plans manual training department in new multi-story high school at Academy Place and Brighton Street, Totenville, S. I. Cost \$1,250,000 with equipment. Federal loan being secured for project.

National Biscuit Co., 449 West Fourteenth Street, New York, has let general contract to White Construction Co., 95 Madison Avenue, for new five-story addition to baking, storage and distributing plant, Tenth Avenue, Fifteenth and Sixteenth Streets, with foundations for five additional floors at later date, including improvements in present factory. Cost \$550,000 with equipment. Louis Wirsching, Jr., is company architect.

Decorated Metal Mfg. Co., 199 Sackett Street, Brooklyn, manufacturer of metal products, textile spools, etc., has arranged for increase in capital from \$150,000 to \$690,000 for expansion.

Mill Basin Asphalt Corp., Avenue U and East Fifty-fourth Street, Brooklyn, has purchased waterfront property at Avenue U and Mill Basin, 150 x 880 ft., and will use for expansion.

Hempstead Planning Board, Hempstead, L. I., George L. Hubbell, chairman, plans construction of new harbor on Jamaica Bay, including piers, oil storage and distributing facilities, warehouses with hoisting, conveying, loading and other mechanical-handling equipment, and other structures, to be known as Nassau Harbor. Cost \$2,000,000 with equipment. Proposed to arrange Federal loan. Howard H. Parsons is chief engineer.

Omega Mfg. Co., Inc., New York, has been organized by Joseph Schwartz, 661 West 181st Street, New York, and Milton L. Brownshield, 2141 Holland Avenue, Bronx, to manufacture electric machinery, generators, parts, etc.

National Oil & Supply Co., 179 Frelinghuysen Avenue, Newark, N. J., has let contract to Truscon Steel Co., 155 East Forty-fourth Street, New York, for one-story addition, rear of 168 Frelinghuysen Avenue, for storage and distribution.

Distilled Liquors Corp., 265 Greenwich Street, New York, H. W. Hildick, head, has let general contract to Thompson-Starrett Co., Inc., 250 Park Avenue, for new two-story and basement distilling plant at Flemington, N. J. Cost over \$100,000 with equipment. Similar plant is also planned by Hildick Corp., an affiliated organization, at Lyons, N. Y., to cost close to like sum, and it is understood that building contract will be awarded to same contractor.

Bamberger Broadcasting Service, Inc., 147 Market Street, Newark, N. J., Station WOR, has plans for new broadcasting station at West Carteret, N. J., with steel towers, generating station and other units for 50,000-watt capacity. Permission has been granted. Cost over \$150,000 with equipment.

R. & C. Engineering Corp., Cranford, N. J., has been organized by William T. Long and Carroll K. Sellers, 6 North Union Avenue, to manufacture machinery and parts.

Trubek Laboratories, State Highway, East Rutherford, N. J., manufacturer of industrial chemicals, etc., has asked bids on general contract for new one-story and basement addition, 45 x 72 ft. Cost about \$21,000 with equipment.

Borough Council, Chester, N. J., plans installation of pumping machinery and auxiliary mechanical equipment, pipe lines, etc., for municipal water system. Cost about \$50,000. Financing is being arranged. Gerald W. Knight is engineer.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Nov. 22 for equipment and accessories for conditioning, refrigerating and furnishing carbureter air at naval aircraft factory, Philadelphia (Specification 7373).

Empire Distilling Co., Philadelphia, recently organized, has taken over plant of Vulcan Alcohol Products Co., Eighty-second Street, consisting of group of five and one-story buildings, and will equip and occupy for new distilling plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 21 for one motor-driven plate scarfing and plate edge planer (Schedule 1018) for Philadelphia Navy Yard.

Penn York Distilleries, Inc., Shrewsbury, Pa., recently organized, has begun construction of new plant on local site lately acquired, consisting of several units to be equipped for initial rating of 500,000 gals. per annum. Cost over \$125,000 with machinery. C. H. Rodgers, formerly connected with Consolidated Distilleries of Canada, Ltd., will be in charge.

◀ WESTERN PENNA. ▶

Pennsylvania Refining Co., Titusville, Pa., plans new addition to oil refining plant on Brown Street. Proposed to begin work early next year. Cost about \$65,000 with equipment.

Joseph S. Finch Co., Clark Building, Pittsburgh, distiller, has let general contract to Rust Engineering Co., Koppers Building, for new one-story addition to plant at Schenley, near Kittanning, Pa., to be equipped as re-gaging unit. Cost about \$35,000 with machinery. Company plans expansion at plant to develop total capacity of 25,000 gal. per day. Work will include new grain elevator, 50,000 bu. capacity, with elevating, screening, conveying and other equipment; new one-story addition for manufacture of wire-bound kegs and barrels, two-story office unit and other structures. Superstructure has begun on new storage and distributing plant. Cost over \$250,000 with equipment.

Town Council, Glasgow, W. Va., plans installation of pumping machinery and auxiliary mechanical equipment for municipal water and sewage systems. Cost about \$38,000. Financing is being arranged.

Hazel-Atlas Glass Co., Wheeling, W. Va., has let general contract to Kutter Construction Co., Fond du Lac, Wis., for new addition to plant at Clarksburg, W. Va., to be equipped for manufacture of corrugated paper boxes and containers for packing glass jars. Cost about \$25,000 with equipment.

◀ OHIO AND INDIANA ▶

Middletown Distilling Corp., Youngstown, Ohio, care of Samuel J. Weiss, Youngstown, recently organized, plans new plant of several units, with power house, machine shop and other mechanical structures. Site is being secured. Cost about \$300,000 with machinery.

W. A. Schuster, Massillon, Ohio, is head of project to construct and operate new brewing plant at Zoar, about 10 miles from city. Proposed to begin work early next year. Cost about \$100,000 with equipment.

Highland Body Mfg. Co., Center Hill, Elmwood, Cincinnati, manufacturer of automobile bodies, has let general contract to Austin Co., Euclid Avenue, Cleveland, for new one-story addition, 63 x 187 ft. Cost about \$35,000 with equipment.

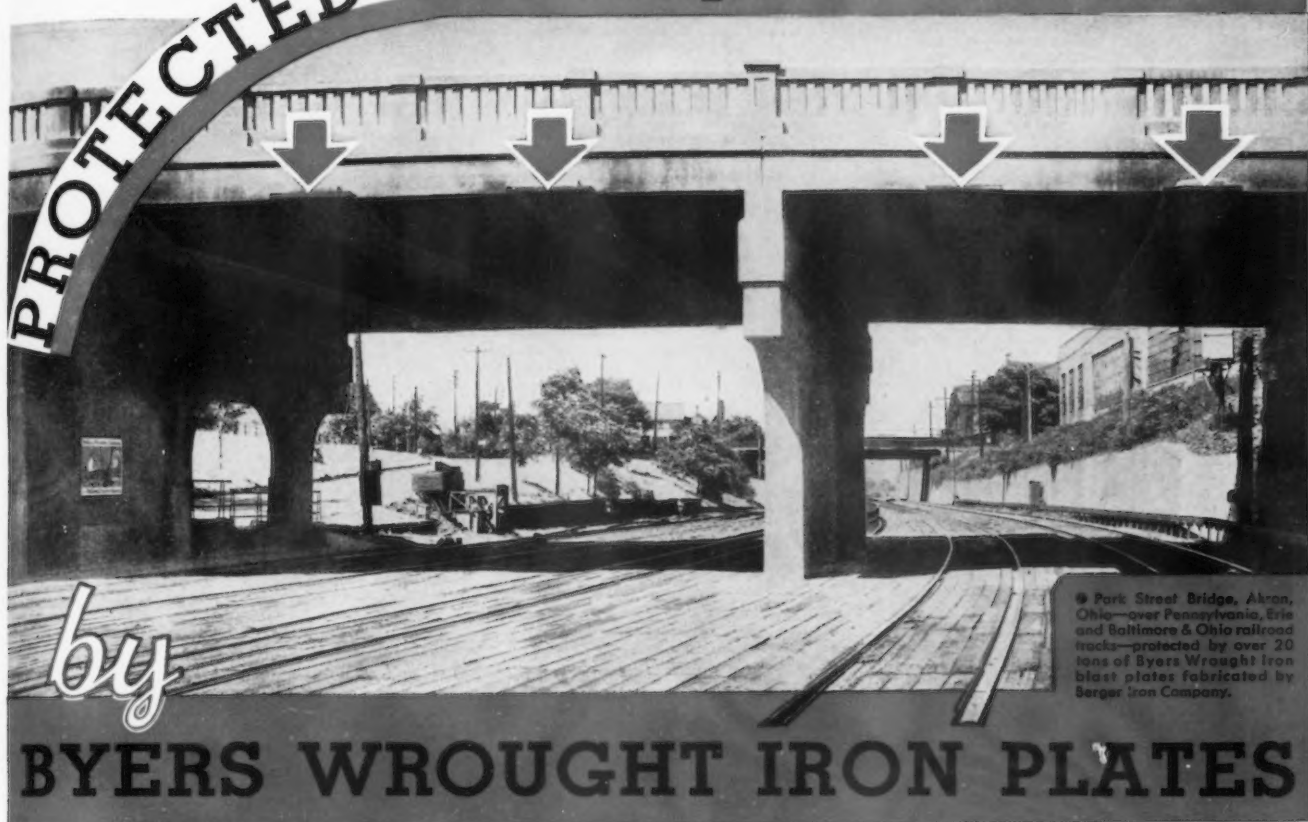
Carnation Milk Products Co., 130 North Wells Street, Chicago, manufacturer of evaporated milk, condensed milk, etc., is considering new plant at Coshocton, Ohio. Cost over \$150,000 with equipment.

Davidson Enamel Co., Clyde, Ohio, recently organized by officials of Davidson Enamel Products Co., Lima, Ohio, manufacturer of enameled iron specialties, capital 4000 shares of stock, no par value, will take over and operate former plant of Vitrifon Iron Products Co., Clyde, recently acquired by last noted company. F. S. Davidson is head.

Nathaniel Barsky, Ashtabula, Ohio, is head of project to organize new brewing company, which will take over one of local buildings of T. P. Fitzgerald, heretofore used for storage service, and will remodel and equip for plant with initial capacity of about 90,000 bbl. per annum. Cost over \$70,000 with equipment.

Goodyear Tire & Rubber Co., Akron, Ohio, has filed plans for new one-story power plant.

PROTECTED from sulphur-laden blasts



● Park Street Bridge, Akron, Ohio—over Pennsylvania, Erie and Baltimore & Ohio railroad tracks—protected by over 20 tons of Byers Wrought Iron blast plates fabricated by Berger Iron Company.

ANOTHER bridge where Byers Wrought Iron has been called upon to take the punishment from hot sulphur-laden blasts. And no wonder wrought iron is being specified today for blast plates on bridges all over the country. Byers Wrought Iron, a standby for 69 years for corrosion and fatigue resistance, is ideally suited to the job of bridge protection.

Hot sulphur-laden blasts from locomotives have a rapidly corrosive effect on bridge structures — wrought iron successfully withstands this punishment. Records of long service prove it. Furthermore, wrought iron stays in place — no cracking and coming loose to endanger traffic.



If you have a bridge job up now — regardless of whether it involves blast plates, a combination of blast and reinforcing plates, cover plates or trough plates — you'll be interested in the wealth of engineering data we can show you to back up a wrought iron specification. For bridge protection information, ask a Byers Engineer or write our Engineering Service Department. Reprints of a recent article, "Fighting Corrosion in Bridge Maintenance," sent on request.

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PLATES • SHEETS • CULVERTS • FORGING BILLETS • STRUCTURALS

STANDARD of QUALITY for 69 YEARS



TODAY BETTER THAN EVER

with one-story water-softening unit adjoining. Cost about \$45,000 with equipment.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Nov. 21 for quantity of copper-coated iron and steel welding rods, and 1000 lb. oxy-acetylene steel corrosion-resisting welding rods (Req. Aero 696); until Nov. 22 for 300 fun control switch assemblies (Circular 140); until Nov. 28 for 60,000 1- to 1½-in. hose clamps (Circular 138), 200 computer assemblies (Circular 139), quantity of compass assemblies (Circular 137).

Gold Medal Brewing Co., Continental Bank Building, Indianapolis, has engaged McGuire & Shook, Architects' and Builders' Building, architects, to prepare plans for modernization and improvements in former plant of Indianapolis Brewing Co., 1300-40 Madison Avenue. New equipment will be installed. Cost over \$75,000 with machinery.

Stutz Motor Car Co. of America, Inc., 1002 North Capitol Avenue, Indianapolis, plans expansion production for increased output of new type of commercial automobile for delivery service, including parts manufacture and assembling. Stock issue of 50,000 shares is being sold, portion of fund to be used for purpose noted.

Ermet Products Co., 2100 Carolina Avenue, Indianapolis, manufacturer of electric storage batteries and other electrical specialties, plans rebuilding of portion of plant recently destroyed by fire. Loss about \$70,000 with equipment. L. P. Epelding is president.

◀ SOUTH ATLANTIC ▶

Tampa Marine Co., Tampa, Fla., plans rebuilding of plant and marine railway, recently destroyed by fire, including construction of two one-story shop units, 50 x 100 ft. Early purchases will be made of machine tools and equipment, air tools, hammers, etc. Fire loss over \$75,000 with equipment. C. J. Hyer is president.

United States Engineer Office, Wilmington, N. C., asks bids until Nov. 21 for new lock and dam on Cape Fear River, including quantity of iron and steel castings, lock-operating machinery, etc.

Town Council, Stanley, N. C., plans installation of pumping machinery and auxiliary mechanical equipment, pipe lines, etc., for extensions and improvements in municipal water and sewage systems. Cost about \$90,000 with equipment. Financing is being arranged.

Department of Prisons, Atlanta, Ga., plans industrial and shop buildings, power house, pumping station and other mechanical units at new state penitentiary, Reidsville, Ga. Cost \$1,500,000 with equipment. Yucker & Howell, Rhodes Haverly Building, Atlanta, are architects; Robert S. Fiske, Walton Building, last noted city, is consulting engineer.

Navy Department, Washington, has let general contract to Murch Brothers Construction Co., 4111 Lindse Street, St. Louis, for four hangars with shop and repair facilities at Corry Field, Pensacola, Fla. Cost about \$360,000 with equipment.

◀ SOUTHWEST ▶

Anheuser-Busch, Inc., 721 Pestalozzi Street, St. Louis, has let general contract to Louis F. Bainter, 2330 South Sixteenth Street, St. Joseph, Mo., for extensions and improvements in brewery at Fifth and Mitchell Streets, St. Joseph. Cost about \$25,000 with equipment.

Charles Werner, 2019 North Broadway, St. Louis, machinist, has let general contract to H. Kissel's Sons, 4107 West Florissant Street, for new one-story machine shop, 40 x 150 ft.

Evans Dairy Co., Oklahoma City, Okla., has plans for new one-story milk processing plant, 68 x 80 ft., for production of powdered milk. Cost about \$25,000 with equipment.

Board of Education, Library Building, Kansas City, Mo., plans new two-story addition to Lathrop Polytechnic Institute, 1214 Central Avenue, with foundations for six additional stories at later date. Cost about \$150,000 with equipment. Financing is being arranged. Charles A. Smith, Finance Building, is architect; Nate W. Downes, last noted address, is mechanical engineer.

Common Council, California, Mo., has been authorized at special election to arrange for bond issue of \$100,000, to which fund of \$35,000 will be added, for new municipal electric light and power plant. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

City Council, Vandalia, Mo., plans installation of pumping machinery and other mechanical equipment, pipe lines, etc., for municipal waterworks. Cost about \$100,000. Financing is being arranged. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

Byrd Air Cooler Co., 1400 Ferris Avenue, Waxahachie, Tex., recently organized to manufacture mechanical cooling equipment, plans early purchase of sheet metal-working machinery and auxiliary equipment, as well as quantity of copper tubing, steel rods, etc. R. J. Byrd is head.

City Council, Plainview, Tex., asks bids until Nov. 20 for equipment for municipal electric light and power plant, including three Diesel engine-generator units, each 750-hp. capacity, boilers, pumps and complete accessories. Also for distribution system. Fund of \$450,000 is available. Montgomery & Ward, Wichita Falls, Tex., are consulting engineers.

Common Council, Brownsville, Tex., plans extensions and improvements in municipal electric light and power plant, with installation of additional equipment. Also expansion in water system, including pumping equipment, pipe lines, etc. Fund of about \$200,000 will be secured for work.

◀ WASHINGTON DISTRICT ▶

Annapolis Metropolitan Sewerage Commission, Annapolis, Md., plans early call for bids for pumping machinery and auxiliary equipment, filters, screens, digester, chlorinator, tanks and other equipment for new municipal sewage disposal and treating works. Robert Berwell, Municipal Building, is engineer.

Hartford Distillery, Inc., Havre de Grace, Md., recently organized, has acquired former local textile mill, and will remodel and equip for new distilling plant. Cost over \$85,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Nov. 22 for extensions and improvements in group of 18 buildings at Naval Powder Works, Indian Head, Md. (Specification 7542).

Metal Package Corp., 811 South Wolfe Street, Baltimore, manufacturer of metal cans and containers, has let general contract to Brown & Matthews Co., 122 East Forty-second Street, New York, for new one-story addition for storage and distribution. Cost about \$21,000 with equipment.

Karol Meat Products Co., 418 South Bond Street, Baltimore, meat packers, will take bids in January for new one-story top addition. Cost over \$25,000 with equipment. David Harrison, 3635 Reisterstown Road, is architect.

Smith-Douglas Fertilizer Co., Norfolk, Va., manufacturer of commercial fertilizers, plans rebuilding of portion of storage and distributing plant, recently damaged by fire. Loss about \$25,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 21 for ten pneumatic grinders (Schedule 1011) for Mare Island, Cal., Navy Yard.

Department of Agriculture, Washington, has secure appropriation of \$1,145,000 for extensions and improvements at experimental station, Beltsville, Md. Bids will soon be asked.

◀ SOUTH CENTRAL ▶

Hampton Cracker Co., Magazine and Thirtieth Streets, Louisville, has let general contract to Wortham Construction Co., Starks Building, for two new five-story and basement additions, 100 x 150 ft. Present capacity will be tripled, with installation of traveling ovens, mechanical mixers, conveyors and other equipment. Cost about \$150,000 with machinery. Brinton B. Davis, Columbia Building, is architect.

Old Jordan-Old '76 Distilling Co., Covington, Ky., recently organized under Delaware laws, is arranging for stock issue of \$1,250,000, portion of fund to be used for new distilling plant on local site.

Chickasaw Wood Products Co., Phillips Avenue, Memphis, Tenn., has purchased plant and property of Kentucky Frog & Switch Co., Thirtieth Street and Kentucky Avenue, Louisville, including tract of 8 acres of adjoining land, and will remodel and equip for new plant for manufacture of wire-bound kegs and barrels for liquor service. Cost over \$75,000 with machinery.

Victory Oil Co., 738 Perdido Street, New Orleans, La., Guy L. Deano, head, plans extensions and improvements in oil processing plant in St. Bernard's Parish, La., including new one-story addition. Cost about \$65,000 with equipment.

Old Joe Distilling Co., Lawrenceburg, Ky., plans establishment of new plant. A preferred stock issue of \$1,200,000 is being arranged, portion of fund to be used for such purpose.

Tennessee Paper Mills, Chattanooga, Tenn., has plans for new one-story storage and distributing plant, 50 x 200 ft. Cost about \$25,000 with conveying, car-loading and other mechanical-handling equipment.

Goodyear Tire & Rubber Co., Akron, Ohio, has acquired textile mill of Connecticut Mills, Decatur, Ala., and will remodel and equip for new tire fabric plant. Cost about \$100,000 with machinery.

◀ MIDDLE WEST ▶

Wilson & Bennett Mfg. Co., 6532 South Menard Avenue, Clearing, Chicago, manufacturer of steel barrels, steel drums, etc., has let general contract to McKeown Brothers Co., 209 West Jackson Boulevard, for new one-story addition, 120 x 167 ft., for storage and distribution. Five-ton traveling crane will be installed. Cost about \$75,000 with equipment. Strobel & Hall, 192 North Clark Street, are consulting engineers.

Old Riverside Distillery, St. Charles, Ill., care of Granger & Bollenbacher, 333 North Michigan Avenue, Chicago, architects, recently organized, has plans for extensions and improvements in former factory at St. Charles for new plant. Cost over \$75,000 with equipment.

American Colortype Co., 1151 Roscoe Street, Chicago, has let general contract to Otto Randolph, Inc., 53 West Jackson Boulevard, for one-story addition, 64 x 140 ft., for storage and distribution. Cost \$25,000 with equipment. Condon & Post, 53 West Jackson Boulevard, are engineers.

Accurate Instrument Co., Inc., 901 Belmont Avenue, Chicago, has been organized by Frank Schrat and Otto Schneider, to manufacture precision instruments and equipment.

Municipal Water and Light Board, Buhl, Minn., plans extensions and improvements in light and power plant, with installation of two new boilers and auxiliaries. Bond issue for \$30,000 will be arranged at early date. Charles Foster, Sellwood Building, Duluth, Minn., is consulting engineer.

Montana Consolidated Mines Corp., Helena, Mont., Lars Carlson, secretary, plans rebuilding of portion of ore mill at mining properties at Spring Hill, about 4 miles from city, recently destroyed by fire. Loss over \$65,000 with equipment.

Common Council, David City, Neb., plans early call for bids for steel tank, 100,000-gal. capacity, on 120-ft. tower, for municipal water service. Hollister Engineering Co., Bankers' Life Building, Lincoln, Neb., is consulting engineer.

Common Council, Moorhead, Minn., has engaged Ralph D. Thomas, 1200 Second Avenue, South, Minneapolis, Minn., engineer, to draw plans for extensions and improvements in municipal electric light and power plant, including installation of boiler equipment, stoker, coal and ash-handling equipment, and accessories. Cost about \$80,000. Federal loan being arranged.

Signal Corps Procurement District, 1819 West Pershing Road, Chicago, asks bids until Nov. 21 for 11,000 ft. galvanized cast steel rigging rope (Circular 14).

Department of Interior, Office of Indian Affairs, Washington, plans new community vocational school at Indian Agency, Winnebago, Neb. Fund of \$35,000 has been authorized.

Common Council, Aurora, Colo., plans installation of pumping machinery, pipe lines, etc., for extensions and improvements in municipal water system. Cost about \$100,000. Financing being arranged. E. Harrison Thwaites, Wilda Building, Denver, Colo., is consulting engineer.

Industrial Development Co., Edgerton, Wis., has plans by Frank F. Drolshagen, architect, 647 West Virginia Street, Milwaukee, for new factory group for occupancy by Nunn, Bush & Weldon Shoe Co., 2322 North Palmer Street, Milwaukee, costing about \$80,000 and consisting of main shop, 152 x 175 ft., one-story; boiler room wing, 32 x 102 ft.; last bin and office wing, 42 x 82 ft., and toilet wing, 32 x 52 ft. P. W. Palmer, Edgerton, is in charge of project.

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EXTRUSION WIRE
BOLT AND NUT STOCK
WOOD SCREWS
MACHINE SCREWS, ETC.
CHAIN WIRE

The Youngstown Sheet
and Tube Company
Youngstown, Ohio

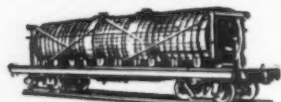
MANUFACTURERS OF CARBON AND ALLOY STEELS

Applying Technological Gains to Reconcile Man to Machine

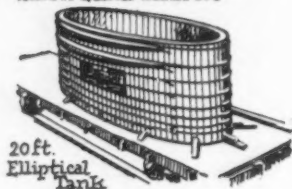
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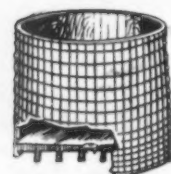
Rubber Lined Storage Tanks



Rubber Lined Tank Car



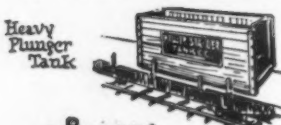
20ft. Elliptical Tank



Concave Bottom Tank



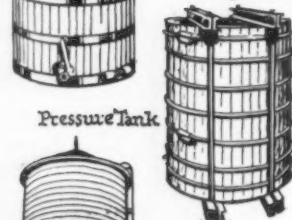
Rectangular Tank with Water Tight Compartments



Heavy Plunger Tank



Tank Equipped with Self-Contained Agitator



Pressure Tank



40000 Gallon Sprinkler Tank

**Wooden Tanks
Rubber Lined
Tanks (WOOD
or STEEL)**
for all Industrial
Purposes
**THE
HAUSER-STANDER
TANK CO.
CINCINNATI, OHIO**

The first step in the direction of control has already been taken in the textile industry by prohibiting any major expansion. We must go further than that or we will have stagnation. It should now be feasible to combine the advantages of monopoly and of competition by using the licensing provisions of the NRA. Any industry which can plan its business ahead could be organized on a basis of competitive franchises, with each unit working under a definite license for a reasonably long term and with the total amount of franchises issued limited to a useful amount. Whether the measure of the license would be a definite volume of business or a permit to operate a definite amount of machinery would depend on the industry. In any case, such a franchise would at once set limits to the operations of the individual concerns, but within those limits provide relative security and freedom. It would make real planning a feasible proposition.

Such procedure of allowing industry to really govern itself would open the way to removal of another serious obstacle to recovery, so far untouched,—the destruction of surplus and obsolete equipment. Such figures as are available indicate that there is in the U. S. nearly twice as much manufacturing equipment as is really necessary. Much of it is obsolete and only kept in operation by paying low wages. A leading official in one of the steel specialty lines stated to the writer that on the basis of financial estimates in their trade, the leading companies would be glad to buy up all the obsolete plants and scrap them, for they could recoup the cost out of economies in their own production (not out of monopolistic prices). But to do that, they would need protection against influx of new surplus capacity robbing them of volume of business.

It is to be noted that any such destruction of obsolete and surplus capacity is merely tangible recognition of an accomplished fact. It would ensure that available jobs are done with the best machinery. It would make for steadier jobs, reduction of wasted effort and permit higher wages.

Such licensing would neither stop progress nor stifle competition. It would make the change of equipment an orderly one. Expansion to take away business from others being outlawed, new equipment would only be installed when it paid to scrap old units. These changes could be made on a rational program basis, and with the machines licensed being assured of steady running, a fairly rapid rate

of renewal would be possible. Such programs generally adopted in the consumer-goods industries would react to stabilize the capital-goods divisions of industry.

In the face of the crying need for improved living standards, opposition to new machinery is a tragedy. It calls for a better job of merchandising labor-saving devices. We must introduce them so that workmen are eager to use them, so that everyone profits by them and so that the investor can finance them. It is not an easy job, but I hope I have shown it is a necessary one and indicated a method of approach.

Zinc For Steel Protection

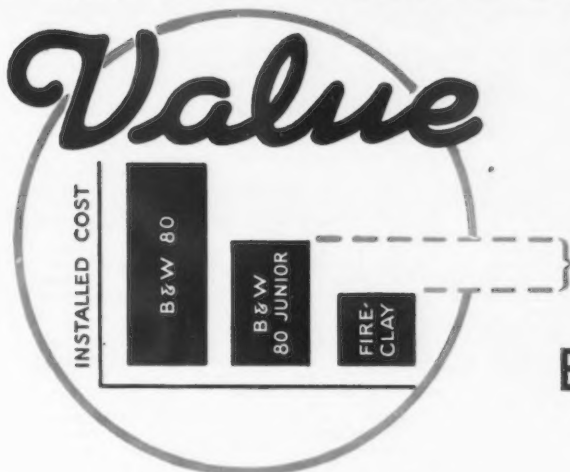
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proof wire for cables which are exposed to the atmosphere. If the cable is also subjected to constant bending, as in power transmission, the problem of finding a corrosion-proof wire becomes more difficult. Theoretically, the thinner the coating of zinc, the less likely will it be to crack under bending. Exhaustive tests made in July of this year have shown that a very thin coating of zinc on wires used in power cables will offer protection under severe bending service. These tests also indicate that for the same thickness of zinc deposit, the electro-galvanized wire rope yields a greater flexing number than hot-dip wire rope. The flex test number increases with a decrease in the thickness of deposit and a happy medium must be struck between the thick coating with its high corrosion protection and the extremely thin coating with its high flexing resistance.

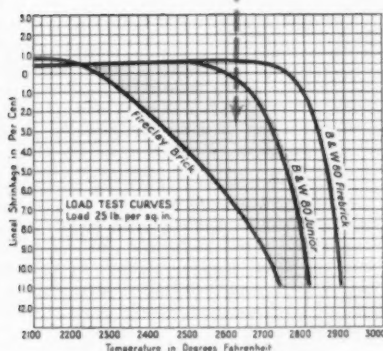
The standardization of cast iron soil pipe and fittings in sizes 2 to 15 in. is rapidly becoming an accomplished fact. On Oct. 27, some 200 copies of the proposed standard were sent to a list of interested firms, individuals and organizations for review and criticism. After final revision, which will be based on the replies received, the standard will be approved under the procedure of the American Standards Association and published for general use. A copy may be obtained for this critical review by addressing a request to C. B. LePage, assistant secretary, American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York.

A New and Outstanding Value

THIS HUGE
DIFFERENCE
IN QUALITY



FOR THIS
SLIGHTLY
EXTRA COST



Load test curves of representative first-quality fireclay brick, B&W 80 Junior Firebrick, and B&W 80 Firebrick. These curves, obtained from the standard A. S. T. M. Test for load and rate of heating, show that with fireclay brick, deformation under load starts at 2150 deg. Fahr., while the 80 Junior is but slightly affected at 2500 deg. Fahr. As the B&W 80 Junior may be used up to temperatures closer to its melting point than fireclay brick to its respective melting point, there is a much wider difference in use limits than is evident from comparison of melting points alone.

An unusual opportunity to save money by reducing furnace maintenance costs is presented by the B&W 80 Junior . . . a new firebrick, exceeded only by the 80 Firebrick in qualities requisite to long life, yet priced but slightly higher than fireclay brick.

And this slightly extra cost is returned by savings, for the ability of the B&W 80 Junior to withstand severe service conditions results in long life, eliminating constant repairs and replacements.

These savings are so substantial as to justify a thorough investigation of this new firebrick. To assist you in making this investigation, we have prepared a pamphlet which concisely presents complete information on the B&W 80 Junior.

Send for your copy . . . a penny postcard will do. No obligation, of course . . . simply address The Babcock & Wilcox Company, 85 Liberty Street, New York, N. Y.



BABCOCK & WILCOX



TRADE PUBLICATIONS

Wedge Sockets.—John A. Roebling's Sons Co., Trenton, N. J. Attractive bulletin describing recently developed "no pinch" type of wedge socket providing rope attachment specially designed to protect wire rope against abuse.

Floor Plate.—Inland Steel Co., Chicago. Illustrated folder describing uses and advantages of 4-way traffic plates, floor plates, safety and matching plates. All size and standard extras data needed by user are documented.

Feedwater Heater.—Worthington Pump and Machinery Corp., Harrison, N. J. Folder describing new type of heater for feedwater or railroad and stationary systems. Cold water is heated by exhaust steam thereby effecting fuel saving.

Flow, Level and Pressure Controls.—Northern Equipment Co., Erie, Pa. Attractively illustrated booklet describing improved types of Copes reducing valves, drainage and liquid level controls, and balanced control valves.

Tangent Dies.—Jones & Lamson Machine Co., Springfield, Vt. Illustrated folder giving data, uses, and advantages of newly developed tangent dies, chasers and holders. Ease of assembling, accuracy and efficiency are said to be greatly improved.

Portable Compressor.—Worthington Pump and Machinery Corp., Harrison, N. J. Illustrated bulletin introducing new 240-cu. ft. displacement compressors, available in various mountings, and equipped with gasoline or electric motor drive.

Circuit Breaker.—Westinghouse Electric & Mfg. Co., East Pittsburgh. It is pointed out that wasted time results from use of fuses in industrial plants. Folder describes "Nofuze" circuit breaker and its application to any type of equipment.

Tank Heads and Manholes.—Lukens Steel Co., Coatesville, Pa. Folder giving complete specifications for various types of heads for storage tanks.

Gas Boilers.—Steam & Combustion Co., 1559 Sheffield Avenue, Chicago. SteCom World's Fair Souvenir Bulletin describing use of steam in exhibits of tire manufacturing, air conditioning, etc.

Feedwater Regulators.—Northern Equipment Co., Erie, Pa. Copes catalog, recently released, announcing improved line of feed line regulators, thermostats, valves, and allied equipment. Installations are illustrated.

High Initial Torque Motor.—Emerson Electric Mfg. Co., 9 South Clinton Street, Chicago. Folder describing new motor with characteristics of repulsion start types, simplicity of split-phase motors, and quiet operation.

Magnetic Separation.—Magnetic Mfg. Co., Milwaukee. Bulletin illustrating separation of impurities during processing of foundry sand in ceramic, slag, and abrasive industries.

Plate for Bridges and Culverts.—Armco Culvert Manufacturers Association, Middletown, Ohio. Folder describing use of multi-plate sections to construct arches and bridges which are said to have great carrying power.

Spiral Pipe.—Taylor Forge & Pipe Works, Chicago. Illustrated catalog presenting latest developments in riveted and welded pipe for all types of service.

Photoelectric Relays.—General Electric Co., Schenectady, N. Y. Booklet presenting latest developments in photoelectric control apparatus for various industrial processes.

Electric Water Heater.—General Electric Co., Schenectady, N. Y. Bulletin describing new type of electric water heater for industrial use.

Non-Ferrous Annealing.—General Electric Co., Schenectady, N. Y. Folder illustrating recently developed bell-type furnace for bright annealing non-ferrous products.

Chains and Sprockets.—Diamond Chain & Mfg. Co., Indianapolis. Catalog giving complete data for selection of suitable chain drive, calculation formulae, tables, and section devoted to special chains for conveyor systems.

Beer Barrels.—Seattle Cornice Works Mfgs., Seattle. Folder illustrating newly developed barrel of internal steel construction but with outside covered with wood staves.

Pumps and Machinery.—Worthington Pump & Machinery Corp., Harrison, N. J. Various bulletins giving detailed data concerning improved types of industrial equipment.

Tumbling Barrels.—Baird Machine Co., Bridgeport, Conn. Folder describing line of tumbling barrels for use in buffing and cleansing work.

Molten Metal Spraying.—Metals Coating Co. of America, Philadelphia. Concise treatise on the subject of coating surfaces with various molten metals. Gives various processes and data concerning adhesion.

Pressure Regulation.—Air Reduction Sales Co., Lincoln Building, New York. Leaflet describing equipment which automatically maintains pressure in welding.

Guard Rail.—Truscon Steel Co., Youngstown. Folder illustrating "Truscon Duraguard," a recently developed highway guard rail.

Highway Guard.—Tuthill Spring Co., 760 Polk Street, Chicago. Booklet concerning economy, results of use, and construction of guard for highways and streets.

Welding Flanges.—Tube-Turns, Inc., Louisville, Ky. Price list bulletin giving dimensional and engineering data concerning welding flanges, tees, etc.

X-Ray Inspection.—Electric-Alloys Co., Elyria, Ohio. Bulletin describing methods employed in subjecting Thermalloy castings to X-ray inspection.

Stainless Clad Steel.—Ingersoll Steel & Disc Co., Chicago. Illustrated folder showing installations and applications of mild carbon steel clad with stainless steel.

Control Instruments.—Brown Instrument Co., Philadelphia. Various folders describing improved line of recording and controlling instruments, carbon content, speed and liquid level.

Water Treating and Testing Units.—Dearborn Chemical Co., Chicago. Booklet covering various types of water treating units for railroad and stationary service.

▲ ▲ TRADE NOTES ▲ ▲

Modern Frog Crossing Works, Chicago, is now occupying entire twenty-seventh floor of Willoughby Tower Building, 9 South Michigan Avenue.

H. Boker & Co., Inc., 101 Duane Street, New York, has been appointed distributor for the following companies: American Rolling Mill Co., Middletown, Ohio, for stainless steel sheets; Simonds Saw & Steel Co., for stainless steel rods, plates and strip, and all standard analysis chrome and chrome nickel alloys of corrosion and heat resisting types, and Michiana Products Corp., for heat and corrosion resisting cast and fabricated alloys, carburizing, annealing lead and cyanide pots, furnace parts and special alloys.

American Cyanamid & Chemical Corp., New York, has opened office in New Center Building, Detroit, with George S. Horsfull as resident representative.

Louis Allis Co., Milwaukee, maker of direct and alternating current motors, has appointed Wallace I. Cousins its representative in Delaware and District of Columbia, with headquarters at 4402 Kathland Avenue, Baltimore.

Northern Equipment Co., Erie, Pa., distributor for Copes feed water regulators, differential valves, pump valves and allied equipment, has designated the C. J. Gaskell Co. as representative in Memphis, Tenn., district.

Pangborn Corp., Hagerstown, Md., has transferred Fred E. Wolf, who has been manager of the Pittsburgh office for more than 10 years, to the New England territory, with office at 19 Orchard Terrace, Arlington, Boston. He has been identified with the company for 18 years.

Duriron Co., Dayton, Ohio, has appointed E. D. Brauns manager of the Philadelphia office, at 1505 Race Street. For the past year he has been in charge of the Boston office, 1255 Little Building, where he is being succeeded by D. Augsburg, who was formerly located at the company's main office.

T. Holland Nelson has moved his consulting office from the Widener Building, Philadelphia, to the T. Holland Nelson Research Laboratories, Spring Mill Road, Villanova, Pa.

A. K. C. Tool Co., 42,195 Sullivan Avenue, Cincinnati, recently incorporated by A. Klingelhofer, C. H. Skeen and W. O. Skeen, is handling a complete line of hand and rotary files and high-speed flexible-shaft machinery.

Stratton & Terstege Co., Fifteenth and Main Streets, Louisville, Ky., has been appointed distributor of Toncan copper molybdenum iron sheets, made by the Republic Steel Corp., Youngstown, Ohio. New distributor will carry complete warehouse stock of these sheets.

Penn Galvanizing Co., Philadelphia, has moved to new and larger works at 2201 E. Tioga Street.

State Machinery Co., 1041-1051 State Street, New Haven, Conn., dealer in new and used machine tools, electric motors, etc., has changed its name to Nutmeg State Machinery Corp.

Betz-Pierce Co., Cleveland, steel distributor, will move its warehouse about Nov. 15 from 2230 East Ninth Street to 1292 East Fifty-third Street where it will have three times its present floor space, railroad track facilities and overhead cranes.

FINANCIAL REPORTS

Republic Steel Corp. reports a net income of \$148,239 for the third quarter of 1933. This compares with a loss of \$407,451 during the second quarter. Net gain from operations during the third quarter after deducting charges for maintenance and repairs was \$2,922,521. After making deductions for interest, depreciation, renewal and plants and for exhaustion of minerals there was a profit from operations of \$215,894.

Youngstown Sheet & Tube Co. reports a loss for the third quarter after all charges including depreciation and depletion of \$1,177,576 as compared with \$2,207,592 in the second quarter. The company showed a profit before depreciation and depletion of \$433,828 for the quarter as compared with a loss of \$597,870 in the second quarter. Total loss for the first nine months of this year was \$6,858,540 as compared with \$9,588,042 in the first nine months of last year.

Allis-Chalmers Manufacturing Co., Milwaukee, reports unfilled orders as of Sept. 30 at \$5,873,753 against \$4,830,996 on June 30 and \$6,882,843 Sept. 30, 1932. Net loss was \$381,532 for September quarter against \$788,920 in the preceding quarter and \$543,795 in September, 1932, quarter.

Link-Belt Co. and subsidiaries for the first nine months of this year report net income of \$52,130 after depreciation, Federal taxes and other charges, equal to \$1.86 a share on the outstanding preferred stock. This compares with a net loss of \$319,809 in the corresponding period of 1932. Sales for the nine months to Sept. 30 totaled \$5,417,538 in comparison with \$5,355,189 in the same months of 1932. September total was \$782,973 as against \$609,189 a year ago.

Jones & Laughlin Steel Corp. and subsidiary companies report for third quarter net loss of \$997,133, compared with net loss of \$1,682,801 in the preceding quarter. For the first nine months of this year net loss was \$4,740,579, against deficit of \$6,192,859 in the corresponding period last year. Operating profit in the third quarter was \$499,149, against operating loss of \$384,206 in the preceding quarter. No dividend on the cumulative 7 per cent preferred stock will be declared for payment on Jan. 1, 1934, according to resolution adopted at a recent meeting of the board of directors.

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Tanks*



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Pickling Equipment
Needs "Q # 1" Tanks*

To insure the most satisfactory and economical operation on this installation the customer specified BASOLIT tanks.

BASOLIT tanks are guaranteed wear-proof and leak-proof against nitric, muriatic, sulphuric and all commercial acids.

Their first cost is *low* and upkeep practically *negligible*.

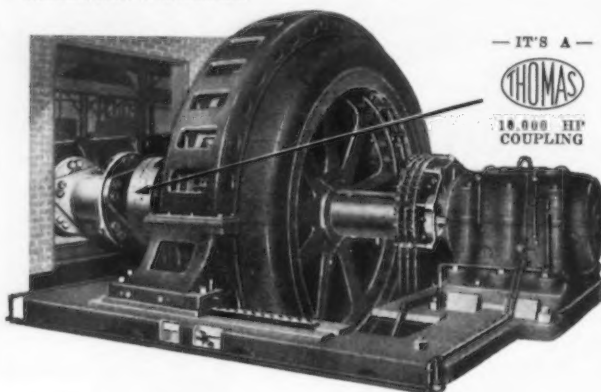
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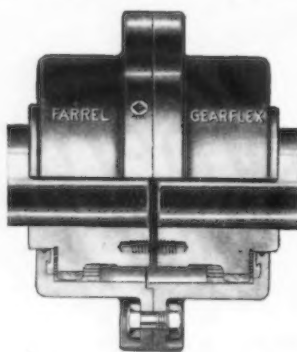
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FARREL-BIRMINGHAM COMPANY, INC.
333 Vulean St., Buffalo, N. Y.

JUST BETWEEN US TWO

Sir!

If, in the prewar days, you asked a publisher what his circulation was, he would bridle like a maiden lady asked to reveal her age. Drawing himself up to his full height, he would answer haughtily, "We cover the field."

But the advent of the Audit Bureau of Circulations changed all that. The goldfish bowl is as private as a convent compared with the circulation records of A.B.C. member-papers.

A.B.C. reports reveal that in the past fiscal year The Iron Age entered 47 per cent more subscriptions than any other paper in the industry. October was the fifth consecutive month in which we beat the corresponding months of 1932. Our circulation is gaining modestly but steadily.

We aren't boasting. The gains are largely a reflection of increasing activity in the industry. When a publication covers such a substantial portion of its field as The Iron Age does, its circulation becomes barometric.

We Get the Run of the Jail

APPLICATION FOR ROUTING FORMS

SING SING PRISON INDUSTRIES
OSSINING, N.Y.

To The Iron Age, 219 W. 11th St., New York

Please furnish us, free of all charge, with a year's supply of routing forms, bearing the following names: (To avoid error, type or "print" names)

Name Title
HENRY KENNEDY DEPUTY SGT. #10
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D. A. PARSONS FOREMAN

Under "Title" please indicate whether reader is president, vice president, general manager, works manager, purchasing agent, bookkeeper, major, captain, engineer, foreman, etc.

1. Do you operate a factory at above address? *Yes*

ONE of our subscribers is pretty much excited about that article on prison-made goods in the Nov. 4 Iron Age. He says a copy ought to be placed in the hands of every U. S. legislator. And what do you suppose was directly next to his letter in the same mail? Of all things, a request from the Sing Sing Prison Industries for a supply of Iron Age routing forms! If you don't believe it, look at the half-tone.

Incidentally, practically every up-and-coming penitentiary gets The Iron Age.

Mr. Farley Gets His Man

THE gentleman with non-meshing mental gears, whose method of beating the post office we exposed on Oct. 26, is in again. Here's his latest letter to us:

"I wish you can send me the letter from the post office. I believe that the post office department is nothing but a lots of hamberger not telling the truth and very did I got plenty of trouble with them myself! For witch they go to the Federal Supreme Court this month in Wash. D. C."

Although our friend is apparently in Mr. Farley's toils, he still thinks he has as much right as any Congressman to mail a letter without a stamp, for his last letter was stampless. It reached us only because the writer employed the tried and true device of giving our name instead of his own as the sender.

He enclosed a pretty Christmas card of several Christmases ago. It bore someone else's name, but that obstacle was hurdled handily by drawing a line through the other name and filling in his own. Don't be too hard on him, Mr. Farley.

He Recited the Whole Thing Over the Phone

THAT series of editorials on the danger of labor domination, appearing on the first editorial page each week, is exciting great interest. One reader was so stirred by "A Divided House Cannot Stand" (page 11, Oct. 26 Iron Age), that he couldn't wait to send it to a friend. He telephoned it in toto.

That's READER INTEREST in full caps.

We're Good! So Why Not Admit It?

Washington is all hot and bothered now about reviving the capital goods industries. We believe we were the first journal to recognize the importance of this subject and treat it adequately. That expert treatise published on pp. 34-35 of Sept. 21 Iron Age, under the heading "How to Get Capital Goods Moving Is Serious Government Problem," is much in demand among those in the know.

—A. H. D.